



U.S. Department of Energy

GUIDE TO IT CAPITAL PLANNING AND INVESTMENT

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PREFACE

The guide is intended to provide readers with an overview of the Department of Energy's (DOE) improved Information Technology (IT) Capital Planning and Investment processes. It also provides managers and staff with practical information designed to help them better understand IT planning in DOE and meet the requirements set forth by the Administration, Congress, and Department. Finally, it provides the framework within which the Department can formulate, justify, manage, and maintain a portfolio of IT investments.

Structure

The guide describes in greater detail the phases, stages, and activities that comprise the Corporate IT Capital Planning and Investment process. (Graphical illustrations of the process are provided in Appendix A, DOE Corporate IT Capital Planning and Investment Process and Appendix B, Roles and Responsibilities “Quick Guide.”) The guide also presents a brief description of current Corporate strategies to implement the process under each phase, a Program-level IT Capital Planning and Investment Management process with the analytical framework that outlines key phases and elements of a mature Program-level process, and current Program process models. To support the Department's IT investment processes, procedures, and practices, the Information Technology Investment Portfolio System (I-TIPS) is introduced to provide both general information and references on the use of I-TIPS as well as more detailed I-TIPS how-to information. The appendixes provide more detailed information on selected aspects of the process.

Portability to Program and Field Offices

While the process described applies primarily to the Department's Corporate administrative and infrastructure-related initiatives, it is assumed that the process could be adapted for Programs and Field Offices. Section 7.0 introduces a modified analytical framework for a Program-level process. It is expected that (1) Department and Program and Field Offices will continue to articulate the strategic and business priorities that IT investments must support as part of Department and Program-level Strategic Planning and Information Architecture processes; and (2) priorities will drive budget and funding decisions and provide the framework to assess the desirability (against competing investment opportunities) and the maximum performance of an IT investment with ongoing management and post-implementation reviews.

Future Revisions

The guide is a work in progress that is revised annually. As the Department's IT Capital Planning and Investment and Information Architecture processes mature and the capabilities of managers and staff involved in implementation increase, the guide will be revised to take advantage of "lessons learned" by practitioners. Future revisions will include practical, "how-to" type documentation for readers on other topics, such as assessing Information Architecture compliance and conducting post-implementation reviews.

INTRODUCTION

The implementation of an effective, efficient, and repeatable IT Capital Planning process is required by law and is essential to ensure sound IT investment decisions. *The Guide to IT Capital Planning and Investment* details the approach the Department of Energy uses to identify, prioritize, justify, fund, and manage Corporate IT investment opportunities. The process described applies to the selection, control, and evaluation of the Department's Corporate and infrastructure-related IT initiatives. Guidelines for Program-Level IT Capital Planning processes are also introduced as well as current Program models.

The guide describes how techniques for IT investment selection and management could be applied within the Department to ensure that individual IT investments, as well as Corporate and Programmatic IT Capital Planning and Investment processes, perform as expected. I-TIPS is introduced as a management tool that could assist the Department in managing the processes in the most efficient manner. The Department's approach is based on legislative requirements, direction provided by the Office of Management and Budget (OMB), recommendations of the General Accounting Office (GAO), Federal Chief Information Officer (CIO) Council, and best business practices.

The Department's approach focuses on three phases.

Select The process used to identify all new, ongoing, developmental investments and operational systems for inclusion into the Department's IT portfolio.

Within the select phase, Department personnel screen, score, rank, and select Corporate IT investments with input provided by functional and technical staff and, as appropriate, by DOE senior managers. Approval of Corporate investments, as well as certain Program IT investments, is made by the Executive Committee for Information Management (ECIM) upon recommendation of the Information Management Steering Committee (IMSC). Other IT investment selection decisions are made by the Department's Program Offices and Field Offices/Sites, as appropriate.

Initial information could be input to I-TIPS for future use in development of the processes.

Control The ongoing monitoring process that manages Departmental IT investments against their planned schedules and budgets to ensure that each investment is properly managed and the need still exists for the investment.

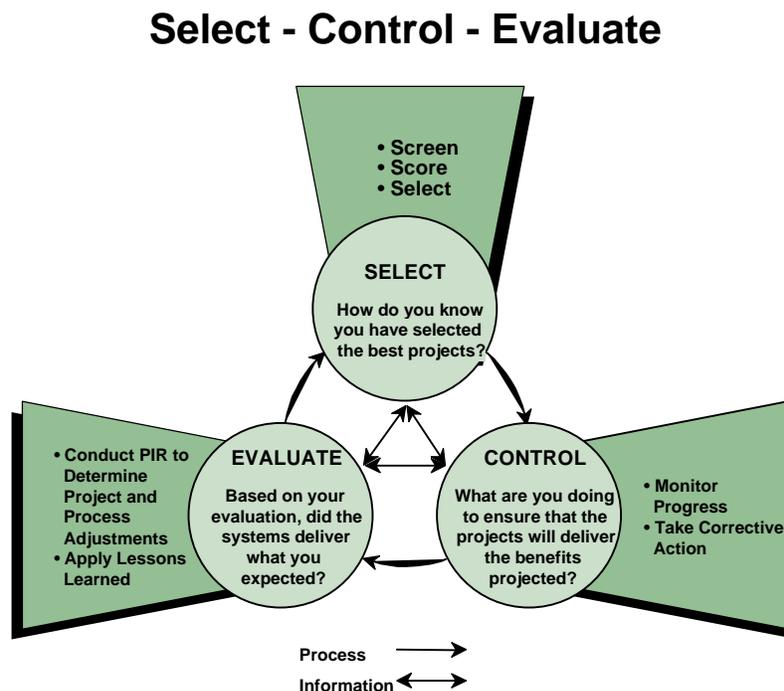
The Project Sponsor monitors the progress of each IT investment against planned cost, schedule, and technical baselines. The Project Sponsor also provides direction for identifying deficiencies and corrective action, should it be required.

I-TIPS could support control process with various project management reports and spreadsheets.

Evaluate The review process used by the Project Sponsor to determine if an operational IT investment is meeting expected mission and business performance goals.

During the evaluate phase, the Office of the Chief Information Officer (OCIO), IMSC, and ECIM review the overall effectiveness of the IT Capital Planning and Investment process. Lessons learned during the evaluate phase should be geared towards modifying future selection and control decisions. Figure 1 illustrates the flow of the select, control, and evaluate process.

Figure 1. Select – Control – Evaluate Flow Process



1.0 SCREEN INITIATIVE PROPOSAL

All proposed Corporate IT initiatives must go through the screen stage, during which representatives of the organization that plan to sponsor and manage the initiative first determine whether it makes general business sense to consider the investment. If an investment is considered sound, the representatives determine the appropriate level of investment analysis (as suggested by the type, size, and risk associated with the proposed initiative), review (such as OCIO, Program, Field Office, or site) and decision-making authority.

Specific roles and responsibilities of the key participants in the screen stage of the Department's IT Capital Planning and Investment process are described in table 1.

Table 1. Screen Stage Roles and Responsibilities

Activity	Project Sponsor	OCIO	IMSC	ECIM
Screen Stage				
1.0 Screen Initiatives	1.1 Develop initiative proposal • Provide additional screening information to OCIO, IMSC, and ECIM, as required	1.2 Review initiative proposal against screening criteria 1.3 Determine Corporate or Program designation	1.4 Determine initiative viability 1.5 Recommend Strategic Information Management (SIM) process, including Funding	1.6 Approve or disapprove SIM process and Funding

1.1 Develop Initiative Proposal

The first stage of the IT Capital Planning and Investment process centers on developing and screening a preliminary initiative proposal, which is prepared by the Project Sponsor. For the screen stage, the proposal must include the minimum set of information necessary to determine whether the initiative meets the Department's Corporate IT Capital Planning and Investment and Information Architecture screening criteria. More detailed information is provided later as the initiative business case is developed either through the Department's Strategic Information Management (SIM) process or by the project team.

Initiative information could be input in I-TIPS by utilizing the Investment Manager function.

The following information must be addressed in the preliminary initiative proposal.

- Initiative Name
- Initiative Description
- Points-of-Contact
- Core Mission/Business Area(s) to be Addressed
- Status of Work Process Reengineering
- Assessment of Private Sector Alternatives
- Expected Beneficiaries

- Expected Returns
- Expected Costs
- Expected Risks
- Concept of Operations
- High-Level Architectural Profile
- Definition of Performance Measures

1.2 Review Initiative Proposal Against Screening Criteria

The principal objectives during the screening stage are to determine whether the initiative is viable and decide if it should be analyzed through the Department's SIM process.

I-TIPS provides screening capability and utilizes similar viability criteria as reflected below.

Apply Screening Criteria

The OCIO uses the following criteria to screen the preliminary initiative proposal.

- Does the initiative support core or priority mission and business functions that have to be performed by the Federal Government? Is it critical to the performance of these functions?
- Does the initiative support work processes that have been simplified or otherwise redesigned?
- Does the initiative support the Department's critical infrastructure assurance effort?
- Is the initiative being undertaken because no alternative is available in the private sector?
- What are the expected benefits of the proposed initiative?
 - Does the initiative lead to improved Program or service operations?
 - Does the initiative lead to improved service delivery to customers?
- What are the expected costs of the proposed initiative?
 - Are total life cycle costs for equipment, computer software applications, support services, and infrastructure likely to exceed \$20 million over a 5 year planning cycle?
- Have expected benefits and costs been identified?
- Is the initiative required by law?

- Are there major risks involved that reduce the chances that the initiative will perform as expected?
- Do performance measures exist and adequately reflect the linkage to the appropriate mission and business functions and objectives?

Responses to the questions should be addressed in the preliminary proposal. In most cases, the initiative's Project Sponsor should prepare the preliminary proposal in collaboration with customers, as well as IT, procurement, budget, and legal staff. Information provided by the Project Sponsor for the preliminary initiative proposal is cursory, but should be enough to identify the initiatives that are not likely to gain approval. More detailed information could be required as the initiative works through the next phases of the planning and investment process.

Screening information could be provided by I-TIPS using "Tasking," "Discussion Database," and/or "Resource Library" functions.

1.3 Determine Corporate or Program Designation

Upon completion of the screen stage, the OCIO will complete review of the preliminary initiative proposal and designate the appropriate level of organizational oversight; i.e., Program or Corporate. The designation is based on several factors, including the type, size, or strategic importance of the initiative. All Corporate investments will be selected and subsequently monitored and evaluated by the IMSC or ECIM. Program, Field Office, or Site-level investments should be selected, controlled, and evaluated by the respective IT decision-making organizations.

1.4 Determine Initiative Viability

The IMSC uses information from the preliminary initiative proposal and associated reviews to provide feedback to the Project Sponsor on the business sense to continue the consideration of the proposed initiative. If the IMSC agrees on the viability of a proposed Corporate-level initiative, the committee ensures that the Project Sponsor is given authority and responsibility to ensure the success of the initiative through the IT Capital Planning and Investment process. The Project Sponsor is the primary spokesperson and business leader for the initiative.¹

Initiative viability could be provided by I-TIPS in "Selection Information" in the Investment Manager function. Detailed information is accessed in "Tasking" and "Database Discussion" functions.

¹ The Project Sponsor may choose to select a Functional Manager, responsible for the business area to be served by the proposed initiative and a Project Manager to oversee day-to-day management of the initiative. Commercial and government best practices have consistently shown that IT investments championed by a Functional Manager or "business leader" have the greatest chance of being successful.

1.5 Recommend SIM Process

If an initiative is considered viable, the IMSC recommends to the ECIM that the initiative proposal be further developed under the Department's SIM process. The DOE SIM process is patterned after the framework and process established by GAO and published in the document entitled, *Executive Guide – Improving Mission Performance Through Strategic Information Management and Technology* (GAO/AIMD-94-115; May 1994). The recommendation also includes an estimate of the funds needed to complete the SIM process.

1.6 Approve or Disapprove SIM Process and Funding

The ECIM approves or disapproves the IMSC recommendation on the execution of the SIM process for all proposed Corporate initiatives. The decision is based upon preliminary proposal information, expectations about the initiative's benefits to the Department and stakeholders, associated costs, including the cost of the SIM process, and risks. The ECIM decision is referred back to the IMSC for action by the Project Sponsor.

Decision information could be provided by I-TIPS using “Tasking” and/or “Resource Library” functions.

2.0 SCORE INITIATIVE PROPOSAL

The Department has developed a uniform methodology to assign a set of numeric values to a proposed initiative on the basis of expected (in the case of a new initiative) or experienced (in cases of pre-operational or operational initiatives) returns, costs, and risks. The methodology relies on the application of explicitly defined and weighted selection criteria in accordance with well-defined scoring rules. Scores assigned to proposed initiatives are used in the ranking process.

Scoring information could be provided by I-TIPS using “Selection Screening Information,” “Selection Scoring Scorecard,” and “Selection Scoring Information” in the Investment Manager function.

Specific roles and responsibilities of the key participants in the scoring stage of the Department’s IT Capital Planning and Investment process are described in table 2.

Table 2. Scoring Stage Roles and Responsibilities

Activity	Project Sponsor	OCIO	IMSC	ECIM
Scoring Stage				
2.0 Score Initiatives	2.1 Apply SIM process and Score initiative, as directed by ECIM 2.7 Add initiative to investment pool, as directed by IMSC • Provide additional scoring information to OCIO, IMSC, ECIM, as required • Re-score on going initiatives, as directed by IMSC	• Monitor on going SIM and self-assessment activities 2.2 Analyze SIM and Scoring results for initiative including Information Architecture Assessment 2.3 Recommend initiative for selection to IMSC	2.4 Review and concur or non-concur with OCIO recommendation 2.5 Determine appropriate investment pool(s)	2.6 Approve or disapprove initiative for addition to investment pool(s)

2.1 Apply SIM Process and Score Initiative

SIM Process

The Department’s SIM process is designed to ensure a clear and effective linkage between IT initiatives and mission and business requirements. Specific Departmental business areas or activities are selected by the IMSC for SIM initiatives. The decision to consider a proposed initiative within the framework of the SIM process is based on expectations about the scope of benefits and beneficiaries, level of cost, and degree of risk associated with the proposed initiative.

The DOE SIM process uses a combination of analytical and collaborative methods. Seven repeatable, flexible steps are taken to achieve the specific goals established for each SIM project.

1. The current environment (baseline) is examined and analyzed to determine the current cost of doing business and enhancements being planned to improve systems and processes supporting the business function.
2. Government and industry best practices and trends are researched to ensure DOE is moving in a direction consistent with other government agencies and the private sector.
3. User requirements and other drivers defining the future state of a business function are defined to determine the needs not being met in the current environment.
4. Alternative solutions are formulated to address the gap between current state and future needs.
5. Financial analysis is performed on selected alternatives to show expected cash flow over a period time, provide the rationale for quantifying benefits and costs, and describe the overall impact in terms of discounted cash flow, payback period, and return on investment.
6. SIM Team examines the financial analysis, other non-quantifiable benefits, risks, and a variety of impacts to formulate their joint recommended solution. During the SIM process, areas for process improvement are identified and recommended to enhance business functions and provide an efficient means of achieving mission requirements.
7. Business case is prepared to support the recommendation for the Project Sponsor and other senior management decision-makers. The business case supports the expenditure of information technology funds, while ensuring the strategic alignment of information technology investments with goals and objectives of the Department.

The Proposal Sponsor is responsible for executing the SIM process. (See appendix D) Detailed information on the Department's SIM process is on the World Wide Web at <http://cio.doe.gov/sim>.

Score Initiative

To begin the scoring stage of the IT Capital Planning and Investment process, the Project Sponsor provides results of the SIM process to the OCIO for review and Information Architecture assessment. The information provides the basis to score the proposed initiative. The application of standard, uniform, and consistent IT decision criteria provides the OCIO and IMSC with the input to draw cross-comparisons and rank IT investments. The scoring criteria are divided into three areas: business case criteria, risk criteria, and benefit-cost criteria.

The following tables (tables 3, 4, and 5) provide a description of each recommended criteria and show the Department's initiative selection criteria cross-referenced to the Office of Management and Budget's "Raines Rules."

Results could be shared in I-TIPS with all interested individuals by utilizing the "Discussion Database" and "Resource Library" functions.

Business Case Criteria captures the investment's alignment to strategy and support for the mission.

Table 3. Business Case Criteria

Recommended Criteria	Description	OMB ¹
Mandatory Initiative	Legislative or regulatory ruling can suggest or require that an IT initiative be undertaken. The strongest argument is made for IT initiatives mandated by law or regulation; however, a Corporate solution may or may not be warranted.	
Alignment to Strategic Objective or Organization Goal	Justification for an initiative is strengthened when the initiative is linked directly to Departmental mission, strategic goal, objective or, to a lesser degree, to a goal or objective of the sponsoring Program or Field Office.	1
Process Improvement	Stronger business case is made for initiatives that assist or generate process improvements across multiple functions and organizations.	3
Consequences of Not Doing The Initiative	Business case is improved when an operation is highly dependent on the initiative, no viable alternatives exist, or delaying the initiative results in significantly higher costs in the future.	2
Impact on Internal and/or External Customers	For a strong business case, the initiative must significantly improve services to internal and/or external customers.	6
Scope of Beneficiaries	The greater the number of functions and/or organizations impacted by the initiative, the stronger the business case.	2
Cross-Functional/ Organizational Impact	Initiatives that support multiple Department business functions provide maximum opportunities for cost-savings and standardization, leading to greater efficiencies throughout the Department.	2,5

¹ Note: Numbers correspond to the OMB Director Raines' Rules. Those criteria without numbers are not mentioned in the "Raines Rules."

Risk Criteria address the likelihood that the investment will not achieve its outcome due to certain factors, such as people, politics, technology, or complexity.

Table 4. Risk Criteria

Recommended Criteria	Description	OMB ¹
Year 2000 Problem	Compliance of mission-critical systems to the Department's Y2K standards reduces risk.	
History of Success	Risks associated with a new initiative increase, if the developer has a poor or undocumented track record. "Developer" includes the overall combination of DOE and contractor staff that manage the initiative, act as system integrator or software developer, or provide key commercial-off-the-shelf (COTS) components.	
Alignment with Information Architecture (IA) and Standards	Adhering to the Department's IT architecture and standards reduces technical integration risk. The smaller and more precise the subset of IT standards that an initiative design follows, the greater the mitigation of risk.	5
Initiative Ownership and Endorsement	Degree to which functional leads and user community take ownership for, endorse, and agree to the requirements of an initiative reduces the likelihood of requirements creep or discontinued future funding.	6
Security	Security requirements and system functional and performance requirements introduce another source of risk—one that is mitigated early by incorporating security concepts and requirements in the design.	
Schedule Risk	Assessing contingencies and identifying risk mitigation activities early in the initiative planning cycle is a best management practice that reduces risk. In addition, when one initiative depends wholly or significantly on another, the risks of the other initiative come into play.	3,6,7,8
Cost Sensitivity	Determining how dependent the cost estimate is on controlled and uncontrolled variables and building-in early detection cost variance warnings reduces overall project risk.	
Performance Measures	Risk of an initiative's actual outcome being different from the intended outcome decreases when outcomes are stated specifically and in quantifiable terms. If specific performance measures for a function have been identified as Departmental requirements, linking initiative performance to functional performance and identifying specific performance targets is easier.	
Incremental/ Modular Approach	Developing and deploying initiatives in functional increments or modular subsystems reduces the risk of failure or loss from a canceled initiative.	
Flexible Acquisition Approach	Risk is reduced to the extent that components or subsystems are acquired quickly, existing contracts are used, and the overall acquisition is broken down into smaller, more manageable, and mutually supportive acquisitions.	
Use of Commercial-Off-the-Shelf (COTS) and Non-Developmental Items (NDI) Software	New development is a major source of risk; initiatives based on COTS/NDI solutions are desirable. The more a solution fits an existing COTS/NDI product without betraying requirements, the less development risk is introduced; however, mixing COTS/NDI products from a range of vendors can introduce its own risk.	

¹ Note: Numbers correspond to the OMB Director Raines' Rules. Those criteria without numbers are not mentioned in the "Raines Rules."

Benefit-Cost Criteria capture the investment's contribution in terms of return on investment and qualitative improvement.

Table 5. Benefit-Cost Criteria

Benefit-Cost Criteria	Description	OMB ¹
ROI (Return/Investment Ratio)	<p>Return/investment (ROI) is a purely quantitative measure based on the ratio of return to investment cost where: Return = Tangible benefit + Replaced system savings – Investment cost.</p> <ul style="list-style-type: none"> • Tangible benefit = Estimated tangible, cost-based savings for a 10-year system life—includes effects of transition such as phase-in and post-training learning curve leading to lower cost savings in initial years. • Replaced system savings = The operations and maintenance (O&M) costs avoided when an existing system is replaced, calculated from the old system's phase-out through the remainder of the investment system's 10-year life. • Investment cost = All costs associated with the investment, including development of the new system, switch-over and phase-out of any existing systems, and operation and maintenance of the new system through a standard 10-year system life. 	4
ROI (Recovery Schedule)	Independent of the magnitude of the ROI (Return/Investment Ratio), the sooner the ROI occurs, the better. The projected year in which estimated ROI will occur also is used to help determine when initiative undergoes a Post-Implementation Review.	
ROI (Intangible)	Initiatives have benefits that cannot be quantified in terms of dollars. Initiatives may be quantifiable in terms of functional performance (e.g., reduced rate of unmatched disbursements), or may not be quantifiable at all (e.g., improved security, force multiplier).	
Payback Period	<p>Payback period estimates the time to recover the original investment outlay. The ratio gives a rough test as to whether the initiative will be recovered within its economic life span. The calculation is defined below.</p> <p>Payback Period = Net investment / Average annual operating cash inflow (or financial return)</p>	

¹Note: Numbers correspond to the OMB Director Raines' Rules. Those criteria without numbers are not mentioned in the "Raines' Rules."

Scoring stage is not intended to be the sole basis for decision-making, but one factor in the overall selection process. The weighting of criteria allows decision-makers to emphasize and prioritize the relative importance of selection factors. As presently weighted, the criteria model places:

- Greatest emphasis on investment's alignment to strategy and mission (approximately 55%).
- Next greatest emphasis is on risk and likelihood that investment is carried out successfully (25%).
- Slightly lower emphasis is on the benefit-cost from investment as a result of government's role (20%).

The ability to develop and refine specific rules is a significant factor in the success of the approach. The weighting and scoring rules are adjusted, as experience with the model and process is gained. In assigning scores, the assessor may be asked to provide additional, supporting information to provide a rationale or justification for the scores provided. Although the scoring approach accommodates the creation of a rank-ordered list of initiatives, final investment decisions should be influenced by additional information, including input derived from collaborative, cross-functional and cross-organizational forums, as appropriate. The Department's IT Capital Planning scoring methodology is presented in detail in appendix E.

Present Scores

Scoring results are presented in a variety of ways to provide visual means to clarify and compare the strengths and weaknesses of initiatives competing for selection to the Department's Corporate IT Investment Portfolio. For example, the use of a *quadrant map* (see figure 2) to compare the scoring results focuses IT managers toward decisive action for each IT project.

- **Quadrant I Projects**
Reflects mission priorities, meets technical requirements, and represents acceptable risks.
Required Actions: Assign high priority, continue or initiate funding.
- **Quadrant II Projects**
Reflects mission priorities, but currently fails to meet technical and ROI risk assessments.
Required Actions: Identify performance shortcomings and resolution prior to proceeding.
- **Quadrant III Projects**
Meets technical requirements, reveals demonstrated capabilities by supplier, but not directly related to Program strategy.
Required Actions: Shift focus from technical merits and features to business needs and benefits.

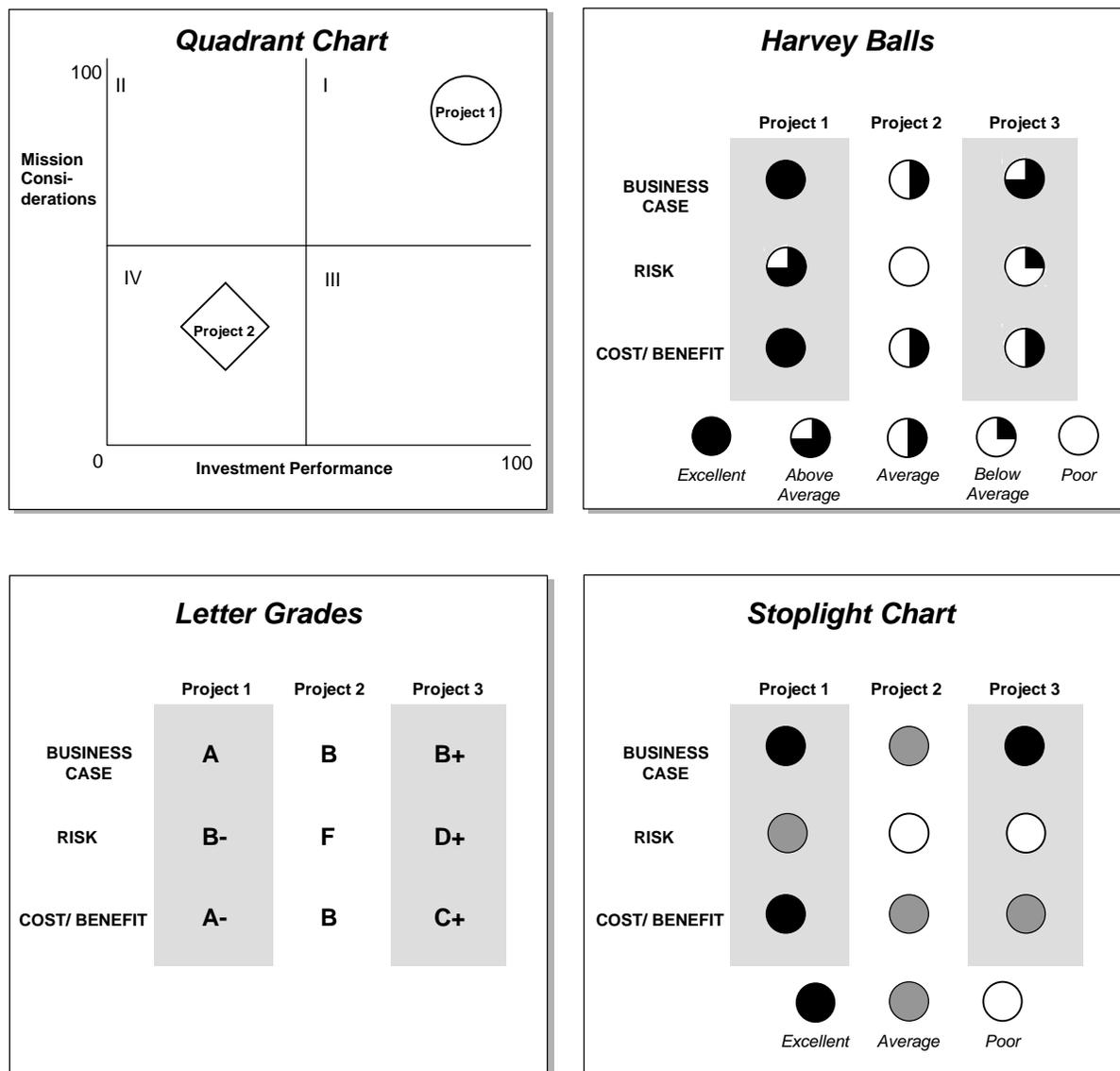
- **Quadrant IV Projects**

Does not directly relate to mission or overall business strategy and presents significant technical and organizational risks.

Required Actions: Terminate project, assign lowest priority, cut losses.

Other methods used to view the results of a scored investment include Harvey balls, grades, and a stoplight chart shown in figure 2.

Figure 2. Presentation Approaches For Investment Scores



2.2 Analyze SIM and Scoring Results

For each proposed initiative, the OCIO reviews results and findings of the SIM process and decides whether to recommend and refer the initiative to the IMSC for further consideration. With the review, the OCIO routinely ensures that a DOE Information Architecture assessment is performed. The initial architectural assessment establishes the degree to which the proposed initiative is consistent and compatible with the Department's Information Architecture. An overview of the factors used to perform the architectural assessment is provided in table 6.

Review process coordination could be provided by I-TIPS using “Discussion Database” and/or “Resource Library” functions.

Table 6. Information Architecture Assessment Factors

Assessment Factors		Description
Business Layer		
1	Business Objective	Business Objective defines the goals of the application in terms of specific business benefits to the organization.
2	Business Functions	Business Functions describe the major lines of business used to conduct business. The functions are broken down further into activities/sub-activities and usually cross-organizational boundaries, e.g. budgeting.
3	Business Processes	Business processes are the steps involved in performing business functions.
4	Business Process Reengineering	Business process reengineering (BPR) is a structured procedure to identify and analyze the components of any business process to determine opportunities for improvement.
Information Layer		
5	Level of Information	Application provides level of information that top management needs through tools like rolled-up detail data, summary reports, or decision support systems.
6	Intuitive Interface	Information is presented through an intuitive interface that users of all levels find acceptable.
7	Reliability and Timeliness	Business Information available through this application is reliable and timely.
8	Information Sharing	Application uses and/or populates information by/with other applications.
Data Layer		
9	Clarity	Data entities are clearly defined and maintained in a data model. Data elements are contained in a data dictionary and include element name, attributes, and relationships with other data entities.
10	Accessibility	Data is accessible to those who need to use it.
11	Integrity	Data Integrity refers to the assurance that the data is valid and accurate.
12	Replication, Duplication, and Redundancy	Data is not duplicative. Data is maintained in a single location and is accessed by those applications requiring it.

Assessment Factors		Description
Application Layer		
13	Development Methodology	Development methodology for this application uses industry-accepted standards and best practices.
14	Maintenance	Applications are maintained efficiently and economically. It is scaled to various sizes and adapted or ported to support future applications.
15	Interoperability	Interoperability among applications involves the deployment of the applications as well as the modular components used in development.
16	Sequencing of Applications	Sequencing of applications based on priorities and factors that reflect the business needs of the entire organization, the least cost build concept, data sharing, and business priorities.
Technology/Infrastructure Layer		
17	Service Delivery	Application meets the service delivery requirements of the customers (i.e., 95% availability).
18	Interoperability	Interoperability at the technical infrastructure level describes a model on which anything may be connected to anything else.
19	Network Connectivity	Application utilizes standard DOE connectivity protocols to ensure that network connectivity is achieved.
20	Technical Maturity	Technical Maturity describes the subjective maturity of the technology in relation to the marketplace.
Security Program		
21	Protection of Business Information	Protection of business information through policies and guidelines ensures the free flow of information within the enterprise without risk.
22	Data, Applications, and Technology	Security encompasses the data, applications, and technology used in this application.
Standards Program		
23	Standard Definitions	Application represents mutual agreement on many standard definitions of business functions, and data and information needs.
24	Standards-Based Applications Tools and Technology Infrastructure	Application is built using standards-based application tools and technology infrastructure.

Architecture assessment factors in table 6 represent an initial set of items used to analyze investments and produce a numeric index for all proposed IT Capital Investments in the current portfolio. The numeric value of each proposed investment represents the degree to which each aligns with the Departmental Information Architecture. The numeric value is used in ranking and prioritization of proposals with respect to selection for funding and approval for implementation. Appropriate pre-formatted information and inputs are required by investment sponsors (e.g., project owners and technical points-of-contact) in order for architectural assessments to be completed and documented. Also, investments may have different architectural reviews at different stages of the three phases of the IT Capital Planning and Investment process. It is anticipated that the process will be reiterated and eventually automated.

2.3 Recommend Initiative for Selection

After completing review, the OCIO provides a recommendation on whether and how to proceed with the consideration of the proposed initiative. The recommendation should highlight significant issues that are likely to affect the success of the initiative, such as cost, technical complexity, impact on business objectives, etc.

2.4. Review and Concur or Non-Concur with Initiative Selection Recommendation

The IMSC reviews the OCIO recommendation and either concurs or does not concur. The decision is critical to determine the initiatives considered for new or continued funding.

2.5 Determine Appropriate Investment Pool(s)

After concurring with the OCIO recommendation for selection, the IMSC must assign the proposed initiative to one or more investment pools. An investment pool is a collection of proposed IT initiatives ready to be considered for selection into a portfolio. Investment pools are used to facilitate the analysis and selection of "competing" initiatives. The number and type of investment pools will be defined by the IMSC.

Initiatives that are not selected for the Department's Corporate IT investment portfolio can remain in the investment pool for future consideration. Initiative proposals should be updated periodically by the Project Sponsors to ensure that portfolio decision-makers continue to have access to accurate and up-to-date information.

2.6 Approve or Disapprove Initiative for Addition to Investment Portfolio

For each proposed initiative, the IMSC decides whether to accept the recommendation of the OCIO. The IMSC provides the ECIM with recommendations on the assignment of initiatives under consideration to one or more investment pools. The ECIM approves or disapproves the IMSC recommendations. For those approved, the OCIO and/or the IMSC begin the process of collecting information for the funding profile (spread of funding over the development years), budget submission, and justification.

2.7 Add Initiative to Investment Pool

The ECIM decision to assign a proposed initiative to an investment pool is an important indicator of willingness to consider the initiative for selection to the Corporate IT investment portfolio. The committee's decision is referred to the IMSC, OCIO, and Project Sponsor. The Project Sponsor is responsible for adding the initiative to one or more investment pools, as directed by the IMSC.

3.0 SELECT INITIATIVES FOR CORPORATE IT INVESTMENT PORTFOLIO

The selection of initiatives by the ECIM included in the Department's Corporate IT Investment Portfolio is based on information gathered and analyzed during the screen and score stages of the IT Capital Planning and Investment process. A summary of the roles and responsibilities of the participants in the selection of initiatives for the Corporate IT Investment Portfolio is presented in table 7.

Table 7. Selection Stage Roles and Responsibilities

Activity	Project Sponsor	OCIO	IMSC	ECIM
Selection Stage				
3.0 Select Initiatives	<ul style="list-style-type: none"> Provide additional selection information to OCIO, IMSC, ECIM, as required, including control status, corrective action, and Post-Implementation Review (PIR) reports 	3.1 Analyze and compare initiatives 3.2 Provide initiative selection recommendation to IMSC <ul style="list-style-type: none"> Reconsider initiative selection recommendation in light of control status, corrective action, and PIR information Review status and corrective action reports 3.6 Review initiative Control status and Architectural Assessment and Provide to IMSC 3.8 Review initiative Evaluation report and Architectural Assessment and Provide to IMSC	3.3 Rank initiatives 3.4 Recommend Corporate Investment Portfolio to ECIM <ul style="list-style-type: none"> Notify Project Sponsor of selection decision 3.7 Analyze report results and Provide continuance recommendation to ECIM, if necessary 3.9 Analyze PIR report results and provide continuance recommendation to ECIM, if necessary <ul style="list-style-type: none"> Reconsider initiatives in light of control status, corrective action, and PIR information Recommend changes to Corporate systems investment portfolio to ECIM 	3.5 Approve or disapprove the Corporate portfolio and Review schedule <ul style="list-style-type: none"> Approve or disapprove changes to the Corporate Investment Portfolio 3.10 Decide to Continue, Cancel, or Modify initiative

3.1 Analyze and Compare Initiatives

The OCIO analyzes and compares initiatives within and across the Corporate IT investment pools. Comparisons between initiatives are made based on expected or experienced return, cost, and risk outcomes. The OCIO also continues to assess the architectural implications of proposed initiatives. Information that supports the analyses includes the following.

- New initiatives - results and findings of the SIM process
- Pre-operational initiatives - SIM information and control status reports
- Operational initiatives - post-implementation reviews

3.2 Recommend Initiative Selection

The OCIO, upon analysis of proposed Corporate IT initiatives, provides recommendations to the IMSC. The recommendations also inform the ECIM of the relative operational, technical, financial, and institutional strengths and weaknesses of each initiative.

3.3 Rank Initiatives

Using the fundamental concepts of portfolio management, such as return, cost, and risk combined with other decision factors, the IMSC reviews the recommendations provided by OCIO to rank initiatives still under consideration. The ranking decision also is influenced by the results and findings of on-going and completed SIM activities, initiative scoring and re-scoring efforts, and control status and post-implementation reports. The ranking is used by the IMSC to create the Corporate IT Investment Portfolio for recommendation to the ECIM.

3.4 Recommend Corporate IT Investment Portfolio

The factors that the IMSC considers when creating a Corporate IT Investment Portfolio are discussed in the following sections. Each Project Sponsor includes a summary level discussion of the factors within the SIM business case. Additionally, for ECIM review, several working portfolios may be prepared to test the acceptability of alternative investment mixtures – varying and modifying initiatives to provide different levels of return, cost, and/or risk.

Overall Risk

IT initiatives are likely to possess some level of technical, operational, financial, or organizational risk. Consequently, the IMSC seeks to formulate a Corporate IT investment portfolio that contains an expected and acceptable mix of high, medium, and low risk initiatives. Risk mitigation plans must be included in the proposals for initiatives with higher levels of risk. Higher levels of risk refer to existing or future situations, which increase the probability that the initiative will not perform as expected, such as greater than expected costs or lower than anticipated returns. The ECIM relies on the IMSC and other IT investment partners to ensure that the level of risk carried in the Department's Corporate IT Investment Portfolio continues to be acceptable. In formulating the portfolio, the IMSC should also consider the risk of not investing in an initiative.

Portfolio Classification Mix

At the Corporate level, most investments are classified as Corporate administrative or infrastructure initiatives. Other classifications may be used to further discriminate among competing initiatives. At the Program level, investments are likely to fall into several categories, including (a) programmatic administrative systems; (b) programmatic scientific and technical systems; and (c) programmatic mission-support systems.

Classification could be facilitated by I-TIPS using the Portfolio Manager function.

Organizational and Institutional Considerations

One IMSC primary objective is to recommend to the ECIM for approval a portfolio of Corporate IT initiatives that enables the Department to achieve core mission and business functions. The following organizational and institutional factors are used to finalize the Corporate IT Investment Portfolio.

- Use a broad understanding of the environment and the institutional considerations surrounding an investment. The committee identifies investments that maximize benefits while minimizing costs.
- Consider public and Congressional interest when making IT investment decisions.
- Determine investments of considerable interest to the Department, Administration, and Congress and reflect strategic goals established by senior Departmental staff.
- Consider carefully the ramifications of not investing in an initiative.
- Evaluate mandated investments in terms of the overall pool of investments—must the investments be made now, or can the investments be addressed at a later point in time, or incrementally.
- Consider whether the investment meets minimum legal requirements or goes beyond the legal mandate leading to unnecessary costs.

To facilitate discussion and consideration of the above factors for comparison, each Project Sponsor may be asked to provide a summary presentation to the ECIM, coordinated by the IMSC. While final prioritization is the role of the ECIM, an initial prioritization based on the SIM results should be developed by the IMSC.

Tasking and coordination activities could be managed by I-TIPS using “Tasking” and “Summary Report” functions.

3.5 Approve or Disapprove Corporate IT Investment Portfolio

After the IMSC members rank the Departmental IT initiatives, the Deputy Secretary, as chair of the ECIM, approves the Department’s Corporate IT Investment Portfolio as well as the overall Departmental portfolio of IT investments. Initiative review schedules for pre-operational and operational initiatives are also approved at this time. Following the approval by the Deputy Secretary, the Project Sponsor prepares the final funding proposal for the President’s budget, and the IT investment is included in the Corporate IT Investment Portfolio. Program and Field Office IT portfolios are forwarded to the ECIM for inclusion in the Department’s overall IT investment portfolio.

3.6 Pre-Operational Initiatives: Review Initiative Control Status Report and Architectural Assessment

The OCIO and IMSC review the Control Status report to assess the progress of each initiative included in the Department's Corporate IT Investment Portfolio. Principal objectives of control reviews are provided below.

- Determine whether initiative under review continues to support mission and business functions.
- Assess the extent to which initiative continues to meet planned cost, schedule, and technical baselines.
- Identify deficiencies and track the completion of corrective actions.
- Ensure that risk management activities, including implementation of risk mitigation plans, are meeting expectations.
- Reach and document the decision to continue, terminate, accelerate, delay, or defer an initiative.

I-TIPS allows for tracking of all required information using "Process Flow" and "Control Status" processes in the Investment Manager function.

IT initiatives within 10% of the planned cost and schedule baseline and which do not vary to a significant extent from planned technical parameters are not likely to be subject to a high level of scrutiny. Greater scrutiny will be given to initiatives that lag behind, exceed the budget, or are subject to regular changes in technical scope and requirements.

3.7 Pre-Operational Initiatives: Provide Continuance Recommendation

The OCIO and IMSC provide review of the status of each IT initiative, as well as the scorecards for re-scored initiatives. The Project Sponsor may brief the OCIO regarding the current status of the initiative and address results of re-scored initiatives. The OCIO and IMSC provide recommendations to the ECIM regarding the outcome of the IT initiative under review.

3.8 Operational Initiatives: Review Initiative Evaluation Report and Architectural Assessment

The OCIO provides review of the Initiative Evaluation report, information on the status of the initiative, re-scoring results and the Information Architecture assessment.

The OCIO forwards the operational initiatives information to the IMSC, who have the responsibility of developing the recommendation for an ECIM continuance decision.

Coordination activities could be accomplished by I-TIPS using the “Discussion Database” function.

3.9 Operational Initiatives: Provide Continuance Recommendation

The continuance recommendation for operational initiatives is similar to the recommendation provided by the OCIO and IMSC for pre-operational initiatives.

3.10. Decide on Continuance

The ECIM makes the final decision on the continuance of pre-operational and operational initiatives. A list of the decision alternatives is provided in table 8.

Table 8. IT Initiative Continuance Decisions

Decision	Definition
Continue As Is	Initiative continues within the existing cost, scope, and/or schedule.
Modify	Modifications to the cost, scope, and/or schedule are required prior to continuing with the initiative.
Accelerate	Initiative is exceeding original schedule goals; therefore, the original baseline is modified and the project schedule for completion is accelerated.
Defer	Initiative must be temporarily put on hold. Reasons for the decision include: <ul style="list-style-type: none"> • Actual cost of the initiative is greater than 10% of the planned cost; • Funds for continuation of the initiative are not in place; or • Initiative has been reprioritized among existing Corporate IT projects or new investments.
Cancel	Initiative is terminated.

Should the ECIM decide to accelerate, modify, or cancel the initiative, the IMSC and ECIM with the OCIO define and schedule the appropriate actions for the Project Sponsor. If a disagreement with the OCIO or IMSC recommendation or ECIM decision by the Project Sponsor occurs, the Sponsor will be provided the opportunity to meet with all concerned parties to discuss and resolve any discrepancies.

Identify and Prioritize Deficiencies

After the ECIM has determined that an IT investment will be continued, modified, accelerated, deferred, or cancelled, the OCIO and IMSC works closely with the Project Sponsor to develop a solution to problems or issues resulting from the decision. The control and evaluation data sheets and scorecards are sources for identifying the primary issues with the investment. For example, the project risk may have increased substantially due to delays in technology that were needed to complete the project. Thus, project funding also may need to be increased, which might impact multiple areas, such as staffing, project management, and other IT investments. Each issue should be addressed, and resolutions should be documented. The OCIO maintains a historic record of corrective actions identified and addressed during the control and evaluation phases of the IT Capital Planning and Investment process. Corrective actions at the project management and execution level are coordinated by the initiative's Project Sponsor. Corrective actions for major deficiencies are described below.

- **Eliminate or avoid** the specific deficiency, usually by selecting a corrective action that eliminates the cause. The Project Sponsor or Project Manager can never eliminate all deficiencies; however, the major ones must be avoided or addressed. Eliminating a deficiency usually involves taking specific corrective action to change a planned event in the initiative. That is, if a deficiency is identified that will occur "if" the initiative continues on its current course, the option is to change the course. Corrective action to resolve deficiencies depends on the extent of change that would be required to the initiative's overall project plan, considering the cost (in terms of dollars and/or time) to make the change, and the calculated severity of the deficiency. As a general rule, elimination should be pursued when the deficiency cannot be managed, or the deficiency is costly to the initiative.
- **Reduce** the expected cost associated with the deficiency through corrective action. The option is employed when the elimination or avoidance of the deficiency is not likely. Instead, attention is focused on minimizing the consequences of the problem.
- **Accept** that a deficiency will occur and develop contingency plans to be executed should the deficiency occur. Contingency plans are pre-defined action steps to be taken prior to and if an identified deficiency should occur.

Having agreed to exercise corrective actions, the IMSC, ECIM, and Project Sponsor should discuss and document the criteria required to resume funding. Documentation should be maintained as part of the initiative's record, and results should be evaluated during the evaluation phase of the process. A suggested method for identifying and prioritizing initiatives is provided in appendix F.

I-TIPS provides functionality to perform tasking by an electronic mail process and Resource Library function to document historical processes.

**Current Corporate Implementation Strategies
for the
Select Phase**

Corporate IT Capital Planning and Investment processes are linked to the DOE strategic planning and budget process. In parallel with the budget cycle, the ECIM and IMSC recommend and determine new initiatives and existing investments for inclusion into the Corporate IT Investment Portfolio.

4.0 CONTROL INITIATIVES

The control phase of the Department's IT Capital Planning and Investment process requires continuous monitoring of on-going IT initiatives through development or acquisition life cycle and deployment, up to point of operation. At that point, the evaluation phase of the process begins. The objective of the control phase is to ensure through timely oversight, quality control, and executive review that IT initiatives are conducted in a disciplined, well-managed, and consistent manner to promote the delivery of quality products and results in initiatives that are completed within scope, on time, and within budget.

The ability to adequately monitor IT initiatives relies heavily on outputs from effective project execution and management activities. Automated project cost and schedule control systems should be implemented to manage, maintain, and provide shared access to initiative baselines, monitor changing business requirements, and track resource allocations.

The frequency of the control review should be established in the selection phase based on factors including strategic alignment, criticality, scope, cost, and risk associated with the initiative. The OCIO should maintain a control review schedule for all initiatives in the Corporate IT Investment Portfolio. A summary of roles and responsibilities of the primary participants in the control phase is provided in table 9.

Table 9. Control Phase Roles and Responsibilities

Activity	Project Sponsor	OCIO	IMSC	ECIM
Control Phase				
4.0 Monitor Initiatives	4.1 Establish and maintain initiative cost, schedule, and technical baselines			
	4.2 Maintain current initiative cost, schedule, technical, and general status information			
	4.3 Assess initiative progress against performance measures; Re-score as necessary			
	4.4 Prepare initiative Control status reports including recommended Corrective Actions for OCIO & IMSC review			

4.1 Establish and Maintain Initiative Cost, Schedule, and Technical Baselines

The Project Sponsor is responsible for establishing project management and execution plans, procedures, and practices to support initiative monitoring activities. The Project Sponsor should provide periodic updates to the OCIO on the status of the initiative's cost, schedule, and

technical baselines. Baselines provide both the framework and sufficient detail to assess the status of the initiative's major milestones, decisions, activities, and work products and deliverables.

I-TIPS provides functionality for managing control cost and schedule milestones, activities, and deliverables in the Investment Manager function.

4.2 Maintain Current Initiative Cost, Schedule, Technical, and General Status Information

The Project Sponsor collects information on resources allocated and expended throughout the pre-operational stage of the initiative. The Sponsor also maintains a record of changes to the technical components of on-going initiative, including hardware, software, and communications equipment. Changes may later be reviewed for continued Information Architecture alignment.

4.3 Assess Initiative Progress Against Performance Measures

During the pre-operational stage of initiative, the Project Sponsor determines whether a business case continues to be valid. If the business case continues to be valid, the Sponsor re-screens the initiative to assess progress against planned cost, schedule, and technical baselines. The primary purpose of assessments is to ensure that initiative is on course and identify issues or deficiencies that require corrective action. Where the business case may no longer exist or be as strong, or if significant changes to the cost, schedule, and technical baselines are required, it may become necessary to re-score the initiative.

Re-Screen Initiative

The initiative screening that occurs during the control phase for pre-operational initiatives is similar to the screening that occurs for new initiatives. During the control phase, the Project Sponsor collects information to address the following basic questions:

- Is there still a need for the initiative?
- Does the initiative meet current and planned cost, schedule, and technical baselines?

Responses support the decision on whether to continue with the investment, as well as identify deficiencies and corrective actions. The OCIO and IMSC expect Project Sponsors to address the questions quarterly and update the status portions of baselines prior to the scheduled initiative control review. Each year, the Project Sponsor and OCIO should conduct a comprehensive control review of each IT initiative in the Department's Corporate IT Investment Portfolio.

Results should be used by the IMSC and ECIM during the annual preparation of the Department's Corporate IT Investment Portfolio.

I-TIPS could facilitate detailed reviews as a repository for pertinent information on control status of initiatives in the Department's Corporate Investment Portfolio.

To begin the control screening stage, the Project Sponsor provides or updates the following types of information.

Planning and Risk Information	<ul style="list-style-type: none"> Project description/statement of work Project organization Risk assessment and mitigation plan Initiative budget estimates Initiative time frame Key schedule milestones Identified project tasks Resource identification Work product and deliverable requirements Technical approach and architecture requirements Quality and configuration management activities Project plan
Initiative Performance	<ul style="list-style-type: none"> Requirements changes Risk and mitigation list Current project organization Current estimate to complete Planned versus actual costs Planned versus actual schedule Current work breakdown structure Planned versus actual staffing Current deliverable assignments Updated technical approach and architecture Initiative action items Quality audits Updated project plan

Re-Score Initiative

At the conclusion of screening, the Project Sponsor determines whether the project should be re-scored against the business case, risk, and benefit-cost criteria as defined in the selection phase. To determine whether re-scoring is required, the Project Sponsor considers the status of the project (cost, schedule, risk, and architecture) as described on the control data sheet and the extent to which the project is on target or varies from planned baselines. The level of variance in

project categories will determine the criticality of re-scoring the investment. Determining the need to re-score is based on several factors. Typically, projects that vary more than 10% from the original baseline in cost or schedule should be closely scrutinized and re-scoring is strongly recommended. If the project's risks or architectural alignment have deviated from baseline assumptions, re-scoring is strongly recommended. Indicators of increased risk or architectural complexity include a high number of development change requests, reduced levels of stakeholder involvement and commitment, or the significant deviation of architectural components from baseline or planned organizational architecture. Table 10 presents the template the Project Sponsor employs to recommend IT initiatives that should be re-scored.

I-TIPS provides the capability to perform re-scoring utilizing “Cost and Schedule Control Information” in the Investment Manager function.

Table 10. Template to Determine Initiatives for Re-Scoring

	I High Variance (>10%)	II Medium Variance (5-10%)	III Low Variance (<5%)
Cost			
Schedule			
Risk (describe the type, level, impact, and probability of major risk factors)			
Architecture (describe the degree of consistency with the organization's baseline and planned architecture)			
Recommended Action	Re-Scoring Strongly Recommended	Re-Scoring May Be Recommended	Re-Scoring Not Likely to be Necessary

The Project Sponsor should be judicious in determining whether a project should be re-scored, as the activity is time-consuming and resource-intensive. A project may vary dramatically from the original baseline in one category, but the project manager may have a sound plan to address the variance. The OCIO also should consider the effect a dramatic variance in one category may have on another category, but which may not be reflected in the assessment. If a project is deviating from original technical or architectural plans, a variance in the original cost is likely and should be reflected in the variance section of the control data sheet. However, the requirement for the project may have been affected by other events (e.g., architectural changes), and the OCIO may determine it is appropriate to re-score the initiative to determine whether it is still viable.

Based on the initiative status and identified variances, the OCIO decides whether the initiative must be re-scored. If the OCIO directs re-scoring, the Project Sponsor, assisted by subject matter experts, re-scores the investment and submits a revised scorecard. The revised scorecard is reflected in an initiative Control Status report prepared by the Project Sponsor, which includes recommended corrective actions for the OCIO and IMSC to review. Re-scored initiatives may compete against other new initiatives in the selection phase. As in the selection phase, the scorecard, as well as other factors, assist the IMSC and ECIM in determining the future status of the initiative. It is expected that most initiatives will not be required to be re-scored and will move forward for status review and decision.

I-TIPS provides a “Summary Report” in the Investment Manager function. All coordination processes are managed using the “Database Discussion” function.

4.4 Prepare Initiative Control Status Reports

With initiative's control review schedule established during the selection phase, the Project Sponsor should prepare a Control Status report for review by the OCIO. As discussed in sections 3.8 through 3.10, the status report will be used to determine whether to continue, modify, or cancel the initiative.

I-TIPS provides reporting process capability with “Summary Report” in the Investment Manager function.

Current Corporate Implementation Strategies for the Control Phase

The Corporate Management Information Program (CMIP) was initiated in 1998 to fund the development of new, enhanced, or replacement DOE Corporate business and administrative systems. CMIP activities for the control phase include Quarterly Technical Reviews of current projects by the CIO and semiannual reviews by senior management in the CMIP Review Board (CIO, CFO, and Director of Management and Administration.)

5.0 EVALUATE INITIATIVES

The evaluation phase of the Department's IT Capital Planning and Investment process begins after an IT investment becomes operational, usually within six months of deployment. As noted in *GAO Assessing Risks and Returns: A Guide for Evaluating Federal Agencies' IT Investment Decision-Making*, "the Evaluation Phase 'closes the loop' of the IT investment management process by comparing actuals against estimates in order to assess the performance and identify areas where decision-making can be improved." The evaluation phase focuses on two primary steps below.

- Determining if the IT investment met performance, cost, and schedule objectives.
- Determining the extent to which the Corporate IT Capital Planning process improved the outcome of the IT investment.

The two steps of the evaluation phase include conducting a Post Implementation Review (PIR) and applying lessons learned, both at initiative and process levels. The PIR should be conducted collaboratively among the Project Sponsor, the Core Project Team members, and the OCIO. Results of the PIR are reported to the IMSC and ECIM to offer them a better understanding of initiative performance and assist the Project Sponsor in directing any adjustments to the initiative. The committees also work internally to revise the process as necessary.

The timing of the PIR is initially determined during the selection phase. The PIR for a newly deployed initiative generally should take place about six months after the system is operational. If a system is cancelled, the PIR should take place immediately. Review of a cancelled initiative defines lessons learned for future IT investment decisions and activities. In addition to the initial PIR, periodic reviews of an on-going initiative's operational performance are conducted. The information gathered during the reviews informs the decision on continuing the investment. The schedule for the reviews is established following completion of the initial review and, for an on-going initiative, at the completion of each review.

Specific roles and responsibilities of key participants in the evaluation phase of the Department's IT Capital Planning and Investment process are described in table 11.

Information in I-TIPS during Select, Score, and Control phases could support project evaluation and overall performance of the portfolio.

Table 11. Evaluation Phase Roles and Responsibilities

Activity	Project Sponsor	OCIO	IMSC	ECIM
Evaluate Phase				
5.0 Conduct Post-Implementation Review (PIR)	5.1 Conduct review as scheduled or necessary, based on documented criteria; Re-score if necessary and include recommended corrective actions			
6.0 Lessons Learned	6.2 Identify lessons learned and recommend process improvements	6.1 Evaluate Corporate IT Capital Planning and Investment process 6.2 Identify lessons learned and recommend process improvements	6.2 Identify lessons learned and recommend process improvements	6.3 Endorse recommended process changes

5.1 Conduct Post-Implementation Reviews

The central objective of the PIR is the IT investment evaluation, in which the Project Sponsor assesses the impact the system has had on customers, mission and Program, and technical capability. The OCIO also works with the stakeholders and the IMSC and ECIM to evaluate the effectiveness of the IT Capital Planning process.

Prior to the preparation of the PIR, the Project Sponsor provides the OCIO with an evaluation data sheet for review. (See sections 3.8 and 3.9.) A sample evaluation data sheet is presented in table 12.

Table 12. IT Initiative Evaluation Data Sheet

SAMPLE IT INITIATIVE EVALUATION DATA SHEET				
GENERAL INFORMATION				
Project Title:				
Project Description:				
Project Sponsor/Manager:				
Project Code:				
PIR Conducted By:				
Date of PIR:				
PERFORMANCE MEASURES				
	Baseline	Actual	Variance	Comments
Quantitative				
<ul style="list-style-type: none"> • Financial • Non-Financial 				
Qualitative				
BASELINE STATUS				
	Baseline	Actual	Variance	Comments
Life Cycle Cost				
Life Cycle Return				
Schedule				
ARCHITECTURAL ANALYSIS				
Architectural Assessment:				
RISK ANALYSIS				
Risk Assessment:				
STAKEHOLDER ASSESSMENT				
General Comments:				
LESSONS LEARNED				
Project Management Assessment:				
Technical Assessment:				
IT CAPITAL PLANNING PROCESS ASSESSMENT				
Selection Assessment:				
Control Assessment:				
Evaluate Assessment:				

The IT investment evaluation focuses on three primary areas described below.

- **Impact to Stakeholders**
Impact system has on stakeholders is typically measured by the Project Sponsor with user surveys (formal or informal), interviews, and feedback studies. The evaluation data sheet highlights results.
- **Ability to Deliver IT performance Measures (Quantitative and Qualitative)**
System's impact to mission and Program should be carefully evaluated to determine whether the system delivered expected results. Information should be compared to the initiative's original performance goals.
- **Ability to Meet Baseline Goals**
 - Cost: Actual life cycle costs to date
 - Return: Actual life cycle returns to date
 - Funding Sources: Actual funds received from planned funding sources
 - Schedule: Original baseline and actual initiative schedule
 - Architectural Analysis: Initiative adherence to Department's architectural standards or modifications required to ensure initiative compliance outside original architectural baseline
 - Risk Analysis: Risks associated with initiative and actions to manage or mitigate risks, as well as associated effects, if any

Upon completion and validation of data collection, the Project Sponsor should prepare a formal PIR presentation for initiatives with variances of +/-10% of the original baseline. Initiatives may need to be re-scored due to changing business, organizational, financial, or technical conditions, and new scores should be included in the PIR. The presentation should summarize the initiative evaluation and provide a high-level summary of lessons learned with best practices for IMSC and ECIM review.

A management report should be submitted to the OCIO for all initiatives to document lessons learned, including project management and technical insights. One primary area for applying lessons learned is in project management. A high-level assessment of management techniques, including organizational approaches, budgeting, acquisition and contracting strategies, tools and techniques, and testing methodologies is essential to establish realistic baselines and ensure the future success of other IT initiatives. To capture management lessons learned, the project manager should develop a management report for publication once the project reaches an endpoint. The management report, including lessons learned, should follow the outline provided in table 13.

Table 13. IT Initiative Management Report

Management Report
Project Title: Project Sponsor: Project Manager: Date of PIR:
I. Description of Project
II. Management Approach <ol style="list-style-type: none"> a. Organizational structure b. Resources c. Acquisition strategy d. Contracting strategy e. Documentation
III. Technical Approach <ol style="list-style-type: none"> a. Architecture (description of hardware, software, adherence to DOE standards) b. Development (if applicable) c. Testing d. Training
IV. Lesson Learned <ol style="list-style-type: none"> a. List of lessons learned b. Recommended best practices

6.0 APPLY LESSONS LEARNED

6.1 Evaluate Corporate IT Capital Planning and Investment Process

Through regular use and practical experience, the Department expects the Corporate IT Capital Planning and Investment process to mature. The OCIO schedules formal and informal review sessions to collect information about the overall effectiveness of the process. Additionally, during fiscal year (FY) 2000, the U.S. General Accounting Office is expected to issue a final version of the IT Capital Planning And Investment Capability-Maturity-Model. When it is available, the OCIO will use this model to identify greater opportunities for improving the process.

6.2 Identify Lessons Learned and Recommend Process Improvements

Having identified the strengths and weaknesses of the current process, the OCIO works with the Project Sponsor and IMSC to develop, recommend, and implement modifications to improve it. With each process modification, the OCIO provides recommendations for IMSC and ECIM review and approval.

6.3 Endorse Process Improvements

The ECIM endorses recommendations to improve the Corporate IT Capital Planning and Investment process. The recommendations are expected to maximize the return on the Department's Corporate IT Investment Portfolio and/or reduce the cost and administrative burdens associated with the process.

**Current Corporate Implementation Strategies
for the
Evaluate Phase**

Post-implementation evaluations have been conducted for proposed CMIP initiatives, such as the Foreign Travel Management System and the Nuclear Materials Management and Safeguards System.

7.0 PROGRAM IT CAPITAL PLANNING AND INVESTMENT PROCESS

Under the two-path IT Capital Planning and Investment Management process approved by the ECIM, programmatic administrative and programmatic mission-support systems are managed by the cognizant Program Office by using a process similar to the Corporate IT investments, which may include developing unique IT investment criteria. Similar to the DOE Corporate IT Capital Planning and Investment process, the Program-Level IT Capital Planning and Investment management approach is based on key activities associated with selection, control, and evaluation. The analytical framework outlines the key phases and elements that would define a mature Program-level IT Capital Planning and Investment process; however, the Program-level process may be adapted to incorporate the unique structure and mission of the individual Programs.

7.1 Program-Level IT Process

Basic guidelines for a Program-level IT Capital Planning and Investment process are provided below. Guidelines are based on key elements associated with the select, control, and evaluate phases as defined within the *GAO Guide*.

Select Phase

Screen Projects

All proposed Program IT projects requiring funding should be submitted for a formal management review for consideration. The Program process may include appropriate management review levels based on the proposed size and scope of the projects. The screening process should include information addressing project justification—costs, benefits, risks, linkage to Program/mission objectives, and architectural compliance.

Analyze and Rank Projects

An established process for analyzing and ranking all proposed IT initiatives should identify explicit criteria that would be applied in comparing, ranking, and deciding proposed IT selections. If the Program uses a scoring model, the scoring elements should be precisely defined and differentiated.

Select Portfolio of Projects

A systematic process for determining priorities and making funding decisions is usually performed by an IT investment review group. The IT investment review group process should define the management level, membership, roles, responsibilities, authority, operating rules, and procedures.

Establish Project Review Schedules

A process is required that defines project monitoring/oversight procedures and criteria for senior management reviews, investment review groups, and management sponsors.

Control Phase

Conduct Investment Control Meetings and Reviews

Projects monitored by senior management may be performed in regular investment control meetings. A management control process should be defined, documented, and repeatable in monitoring and reviewing IT projects as well as involve the right people (Program, IT, and budget).

Feed Lessons Learned Back to Selection Phase

To evaluate decision-making processes, lessons learned from investment control reviews may be utilized to refine the selection criteria and to improve the process. The process may include compiling a Program track record on costs and benefits attributable to IT.

Conduct Management Review of Projects

The Program management review of projects includes using the information and data provided in the investment control process to make decisions about the future of each project. Key decisions may result in whether to cancel, modify, continue, or accelerate a project.

Evaluate Phase

Conduct Post-Implementation Reviews

The post-implementation review defines the performance outcomes of a project. The Program should establish a process for independent review that evaluates the historical record.

Conduct Lessons Learned and Customer Satisfaction Assessments and Submit Reports to Management

The post-implementation review defines a process for taking action for changing, improving, and strengthening management decision-making processes. PIR results are reported to senior management including assessments of customer satisfaction and technical capability of the Program's projects.

Define Criteria for Successful Outcomes

The post-implementation review evaluates measurements of actual versus projected performance. Generally, performance measurements are established prior to project implementation, and performance measurements are taken after implementation of the project.

7.2 Program-Level IT Models

To institutionalize and implement requirements of the Clinger/Cohen Act, specific Programs have defined and documented a process to ensure that IT projects are well-planned and well-managed. In 1995, the Office of Civilian Radioactive Waste Management (RW) Information Management (IM) organization was restructured to better support a Corporate approach for doing IM business enterprisewide. In 1997, the Office of Science (SC) initiated a Strategic Information Planning effort to address long-term data, information system, and technology needs. The IT planning and investment models described below illustrate how larger Programs have formalized and adapted key elements in their IT Capital Planning activities to accommodate the unique structure and mission of the Programs. A smaller Program model by the Office of Hearings and Appeals (HG) with a minimum layer organization structure illustrates how the Program has adapted an informal process for IT Capital Planning and Investment management.

Office of Civilian Radioactive Waste Management

The Office of Civilian Radioactive Waste Management established the Information Management Council to review, coordinate, and integrate RW information resources from a Corporate perspective. The IM Council structure ensures that RW information resources are implemented and managed in an efficient and effective manner and guides and controls the evolution of the RW Information Architecture Baseline.

The first major initiative emerging from the RW IM Council was the establishment of an integrated IM Planning Team tasked with establishing an IM Planning Framework. The IM Planning Framework included a Programwide IM Planning process and the development of Strategic and Multi-Year IM Program Plans, as well as Annual Planning Guidance in support of work plan development. The FY 1998 Annual Planning Guidance identified Management and Administration Actions, which included implementation of an RW IT Capital Planning process.

To implement the RW IT Capital Planning and Investment Management process, four decision-making bodies have been instituted under the IM Management structure.

- **Information Management Steering Committee (Senior Management Board)**
The Board is a senior-level forum for identifying Program information needs and acting as a link between IM activities and the Program.
- **IM Council (IM Managers)**
The Council is an IM enterprisewide policy, planning, and decision-making body.
- **Architecture Working Group (AWG) [Sub-Committee of the IM Council]**
The Working Group addresses technical IM issues and manages the Information Architecture baseline.
- **Records Management Working Group (RWG) [Sub-Committee of the IM Council]**
The Working Group addresses issues related to the establishment, implementation, and maintenance of records management policies and requirements.

The RW Program Management & Operating (M&O) contractor has established an Information Technology Steering Committee (ITSC) to identify, rank, and approve IT initiatives. Additionally, the M&O issued a *Capital Planning Business Process Model Report* that describes the current M&O Capital Planning processes, functional requirements, and a model for future Capital Planning processes.

The Information Management Steering Committee sponsored an analysis of RW current IT Investment decision-making practices, *Draft IT Investment Management Baseline and Recommendations Report*. The report assisted the Program in identifying new requirements (under the Clinger/Cohen Act of 1996) and ensuring implementation of the IT Investment Management process that is in full compliance with the Act and appropriate for the Program. The analysis addressed the Program’s IT select, control, and evaluate practices as compared to the IT Investment Management approaches recommended by the GAO and Federal Government practices.

Major elements of the Program’s current enterprisewide IM planning process during a fiscal year are shown in table 14.

Table 14. RW Programwide Planning Activities

RW Programwide Planning Activities	
February	RW IM Managers and Contractor Support Staff meet to conduct IM strategic planning and five-year IT operational planning.
March/April	RW issues an updated <i>Information Management Strategic Plan</i> .
June	RW issues the <i>Information Management Multi-Year Program Plan</i> , which describes the work scope, summary-level funding estimates, and the major actions and milestones required over a five-year period to support Program objectives defined in the <i>OCRWM Program Plan</i> and IM strategic goals described in the <i>IM Strategic Plan</i> .
July	RW IM Managers and Contractor Support Staff meet to refine actions identified in the <i>IM Multi-Year Program Plan</i> for the coming fiscal year based on additional budget and Program-level planning information.
July/August	The Program issues the <i>Information Management Annual Planning Guidance</i> document to provide guidance to contractors in the development of the coming fiscal year work plans.

The *Draft IT Investment Management Baseline and Recommendations Report* further reported select process activities as follows.

The process was first implemented in 1995 to ensure that enterprisewide IM strategic and operational planning support Program priorities, missions, and objectives. In FY 1998, RW augmented its standard IM planning process to include a Call for IT Initiative Information (ITII). The ITII requires IM managers to make the business case for IT initiatives, conduct risk analyses, identify expected outcomes, and prioritize competing IT requirements consistent with Clinger/Cohen Act requirements. The ITII was considered a preliminary step to comply with the Act.

The M&O contractor also develops a Short Range Plan (SRP) based on input from functional users that identifies the IT procurements for the coming fiscal year. Initiatives not identified in the SRP must obtain an out-of-cycle approval by the M&O IM Manager before the Procurement Office releases funds for the initiative.

To support IT investment decision-making, the M&O established an Information Technology Steering Committee (ITSC) that serves as a communications link between the IT community and functional-level users. Membership on the ITSC was originally intended to be M&O Operations Managers, but had been delegated to their representatives. The ITSC ranks and approves initiatives identified during the development of SRPs.

The M&O also issued a *Capital Planning Business Process Model Report* that describes current M&O capital planning processes, functional requirements, and a model for future capital planning processes. The *Report* identifies a high-level model for implementing an IT capital planning process consistent with the Clinger/Cohen Act. The model represents preliminary thinking on future IT capital planning efforts. The M&O is developing an internal procedure for compliance with the Clinger/Cohen Act.

Current control processes are based on basic project management practices as they relate to specific systems or initiatives; for example, through systems development life cycle documentation and project plans. No formal process is in place to document major IT investment decisions (except through the budget process). Other actions and decisions may be documented through informal communications, such as e-mail messages.

RW does not have standardized evaluation procedures. Informal methods are used to assess a project's impact on mission performance and to determine future actions.

Office of Science

The Strategic Information Planning (SIP) project, sponsored by the Office of Science Executive Steering Committee (ESC) and championed at the executive management level, produced an *SC Information Management Strategic Plan*. The *SC Information Management Strategic Plan* is a five-year plan that describes the business functions, data, applications, and technology information upon which all IM support for SC business activities is based. The *IM Strategic Plan* utilizes the Enterprise Architecture Planning methodology for its IT Capital Planning and Investment Management process and comprises six key components.

- **Principles** – Fundamental rules (architectural principles) used by SC for making decisions.
- **Business Model** – SC business activities. The *SC Information Management Strategic Plan* identified the need to reengineer Information Management processes to support the SC Business Model and defined the IM activities associated with six core SC business functions: representing and promoting SC; setting direction for research; formulating the

budget; executing the budget; managing human resources; and managing support services.

- **Information Resources Catalog** – Database of the organization’s applications and the technologies and data associated with them. The Information Resources Catalog (IRC) serves as a repository for information about systems developed by SC Information Management, SC Program Office Systems, and DOE Corporate Systems that SC may be required to use or may find useful. IRC allows SC to know about its system assets and to understand the impacts as new technologies and systems are rolled out.
- **Technology Infrastructure** – Technology Infrastructure needed to support the SC business activities. The Technology Architecture plans the necessary hardware, software, and connectivity infrastructure to support the architected applications projects. Two main activities of the Technology Architecture process include: Technology Positioning Statements, which summarize the work done by SC researchers and project technologies SC needs to implement within an approximate time frame to support planned application development specified in its Application Architecture; and a Technology Deployment Plan, which outlines technology projects and functions as a complete map of the changes to be implemented to build the technologies and applications that provide interfaces with the data to fully support SC’s user community.

The **Information Management Board (IMB)**, established in December 1997, provides SCwide representation on IM issues and directions. The IMB meets monthly and reports to the Executive Steering Committee. Management activities of the IMB include the following.

- Making recommendations on priorities, standards, and changes to IM architectures
- Providing guidance on IM issues
- Approving IM policies and procedures
- Facilitating expanded customer involvement and feedback related to IM issues by identifying participants for various customer focus groups

The **Information Management Board** consists of one voting member from each of the ten SC Program Organizations: Offices of the Director, Laboratory Policy High Energy and Nuclear Physics, Biological & Environmental Research, Basic Energy Sciences, Planning and Analysis, Fusion Energy Sciences, Resource Management, Advanced Scientific Computing Research, and Laboratory Operations and Environment, Safety and Health. The IMB is chaired by a member of the **Executive Steering Committee**.

The **Executive Steering Committee**, the key decision-making senior management body under the Office of the Director, is comprised of the Directors and Associate Directors of the Program Organizations, and meet monthly. The ESC provides senior management budget and policy approval and oversight on IT initiatives, recommendations, and issues presented by the Information Management Board.

The Information Management Board and Executive Steering Committee also meets annually to review projects and resolve outstanding issues on a macro level, usually toward the end of the fiscal year.

The *SC Information Management Strategic Plan* recognizes a decentralized decision-making structure for IT decisions primarily related to the development and implementation of a system and/or the acquisition of hardware and software. Under the decentralized structure, certain IT decisions are made by a centralized IM provider organization (e.g., Administrative and Information Management Division) and other decisions are made by the line of business organizations (e.g., Program Office).

SC Policies and Procedures state that written Performance Measures and Service Level agreements are established and that written evaluations are prepared. Progress reports in establishing the performance measures and the results of evaluations are presented quarterly to the IMB.

Measurements of SC customer satisfaction and technical capability have been implemented in surveys administered to the user community by the Information Management Team. Survey results on pre-implementation and implemented projects provide feedback to management.

Office of Hearings and Appeals

Within the Office of Hearings and Appeals, under the Office of Management Operations and Management Information Division, IT Capital Planning and Investment Management is an informal process. Due to a minimum layer organization structure, currently 42-person staff and approximately \$4.2 million appropriated for the HG budget (excluding the Board of Contract Appeals), the select, control and evaluate process is conducted in an informal team approach for Programmatic administrative support systems.

The Management Information Division's informal Select process for *non-major projects* is characterized by the following activities.

- The system administrator articulates requirements to the information resource manager, who is the Director of Management Information.
- An internal discussion is held between the information resource manager and computer staff on new requirements that have significant Program operational impact.
- A report outlining the options and recommendation is prepared by the initiating computer staff member and provided to the information resource manager for approval.

The responsibility and accountability for IT Capital Planning is delegated to the HG Director of Management Information. For *major IT Capital Planning projects*, an Issue Paper format approach is the selected venue for presentation of information on technology issues to the HG senior management staff.

Two significant projects undertaken within the past few years consisted of the below activities under the **select process**.

- **Issue Paper** (documented project justification) on the Proposed Project is developed that outlines the Issue, Proposal, Background, Pros, Cons, Special Considerations, and Recommendations. The Issue Paper also outlines the Costs and/or Cost Savings.
- **Benefits Paper** on the proposed project is developed.
- **HG Deputy Directors** participate in the review and decision-making on major Capital Planning projects with the HG Director and the Information Resource Manager.

For the **control process**, standard project management processes are utilized to control milestones and accomplishments.

8.0 I-TIPS ADMINISTRATION AND USE

The DOE OCIO staff has developed I-TIPS to support the management and reporting of IT investments in accordance with Clinger/Cohen requirements. The system is currently in use for the management of the Corporate portfolio of systems and is being made available to Programs and field sites for management of programmatic IT investments. Programs electing to use the system to support the IT management process must follow the administrative steps outlined below. Detailed system information and instructions are available in the DOE I-TIPS User Guide. The DOE I-TIPS Users Guide is available for those who require very specific guidance on the use of I-TIPS to support the IT Capital Planning and Investment processes. Copies of the User Guide are available from the OCIO Planning Division. For more information on I-TIPS, access the public demonstration Web site at <http://www.itips.gov> or contact the OCIO Planning Division.

8.1 Accessing System

Organizations electing to utilize the system must contact the I-TIPS program manager, Jim King, OCIO Planning Division, 202-586-8041, james.king@hq.doe.gov to establish user identifications (IDs) and password access. I-TIPS is a Web-based application available to DOE users through the DOE Web server. The hardware/software requirements for system use are a desktop computer with an Internet browser (MicroSoft Explorer 4.0 and/or Netscape Navigator 4.0 recommended).

8.2 System Administration

Each organization using I-TIPS must designate a system administrator. The administrator is responsible for granting access rights to users within the organization. The rights include permission(s) to add, read, edit, and delete individual initiatives (systems/projects). The administrator also grants permission(s) to include individual initiatives into investment pools and to create portfolios. A portfolio is a logical grouping of IT investments that are compared, managed, or reported as a group. Portfolios are created from initiatives in the investment pools. Users are granted access to portfolios and allowed to read, edit, and provide recommendations for adding or deleting investments within a portfolio.

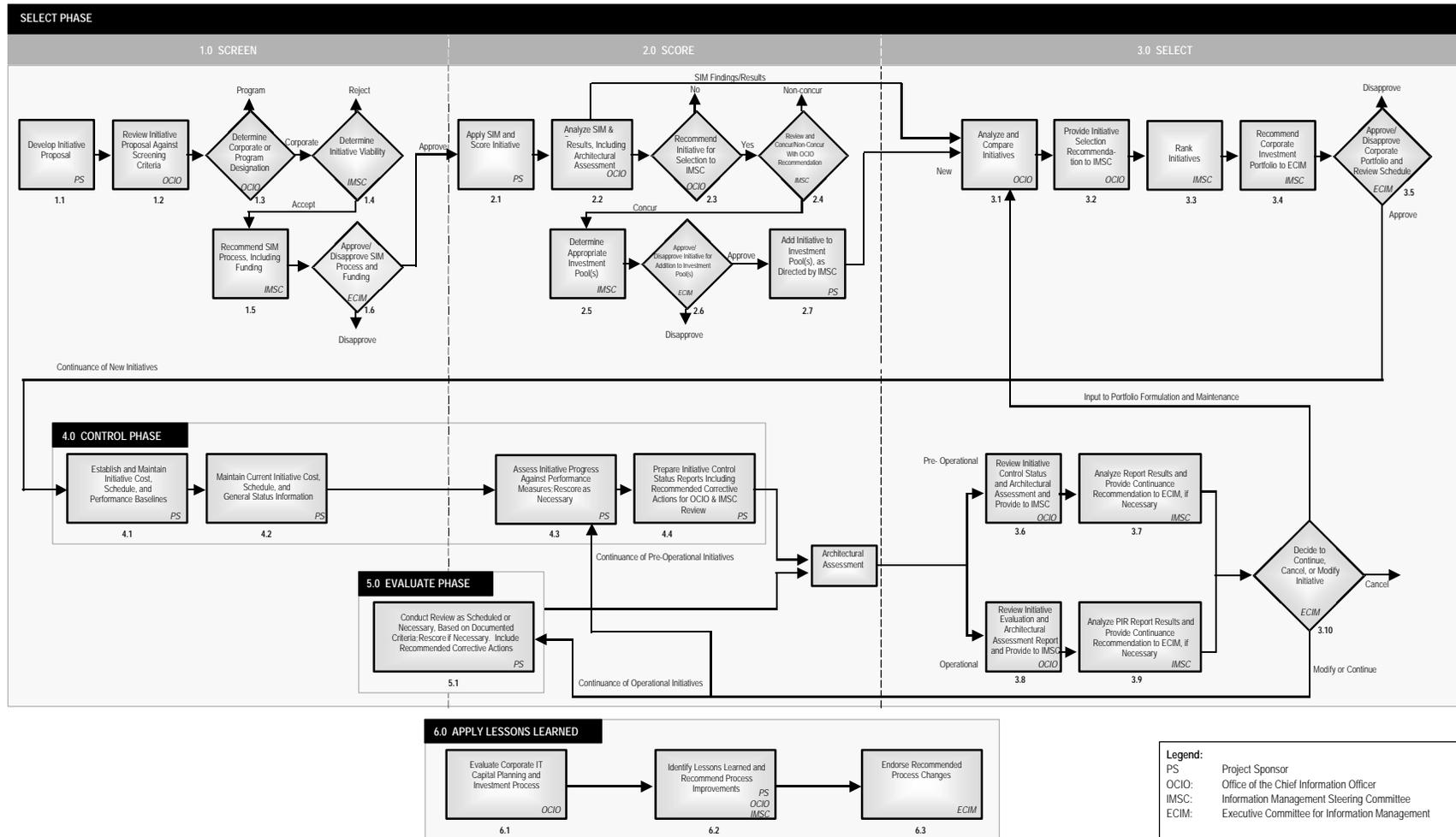
8.3 Managing an Investment

As IT investment opportunities are identified, system users enter basic initiative information into the system. I-TIPS is designed to allow individual Project Managers to update project, baseline, performance measure, and other related data to reduce the burden of gathering system information. The system allows for generation of reports to support discussion and decision-making related to a single initiative or groups of initiatives (portfolios).

I-TIPS contains data entry fields that support screening, scoring, and ranking activities. Specific details on data fields captured by the system and step-by-step instructions on performing a scoring activity are described in the I-TIPS User Guide. Other activities, such as architectural assessments and external reporting (such as, OMB A-11 IT report), are also supported by I-TIPS.

APPENDIXES

Appendix A. DOE CORPORATE IT CAPITAL PLANNING AND INVESTMENT PROCESS



Appendix B. Corporate IT Capital Planning and Investment Process Roles and Responsibilities “Quick Guide”

Activity	Project Sponsor	OCIO	IMSC	ECIM
Select Phase				
1.0 Screen Initiatives	1.1 Develop initiative proposal • Provide additional screening information to OCIO, Information Management Steering Committee (IMSC), Executive Committee for Information Management (ECIM), as required	1.2 Review initiative proposal against screening criteria 1.3 Determine Corporate or Program designation	1.4 Determine initiative viability 1.5 Recommend Strategic Information Management (SIM) process, including Funding	1.6 Approve or disapprove SIM process and Funding
2.0 Score Initiatives	2.1 Apply SIM process and Score initiative, as directed by ECIM 2.7 Add initiative to investment pool, as directed by IMSC • Provide additional scoring information to OCIO, IMSC, ECIM, as required • Re-score on going initiatives, as directed by IMSC	• Monitor on going SIM activities 2.2 Analyze SIM and Scoring results including Architectural Assessment 2.3 Recommend initiative for selection to IMSC	2.4 Review and concur or non-concur with OCIO recommendation 2.5 Determine appropriate investment pool(s)	2.6 Approve or disapprove initiative for addition to investment pool(s)
3.0 Select Initiatives	• Provide additional selection information to OCIO, IMSC, ECIM, as required, including control status, corrective action, and Post-Implementation Review (PIR) reports	3.1 Analyze and compare initiatives 3.2 Provide initiative selection recommendation to IMSC • Reconsider initiative selection recommendation in light of control status, corrective action, and PIR information • Review status and corrective action reports 3.6 Review initiative Control status and Architectural Assessment and Provide to IMSC 3.8 Review initiative Evaluation and Architectural Assessment report and Provide to IMSC	3.3 Rank initiatives 3.4 Recommend Corporate Investment Portfolio to ECIM • Notify Project Sponsor of selection decision 3.7 Analyze report results and Provide continuance recommendation to ECIM, if necessary 3.9 Analyze PIR report results and Provide continuance recommendation to ECIM, if necessary • Reconsider initiatives in light of control status, corrective action, and PIR information • Recommend changes to Corporate systems investment portfolio to ECIM	3.5 Approve or disapprove the Corporate Portfolio and Review schedule • Approve or disapprove changes to the Corporate Investment Portfolio 3.10 Decide to Continue, Cancel, or Modify initiative
Control Phase				
4.0 Monitor Initiatives	4.1 Establish and maintain initiative cost, schedule, and performance baselines 4.2 Maintain current initiative cost, schedule, and general status information 4.3 Assess initiative progress against performance measures; Re-score as necessary 4.4 Prepare initiative Control status reports including recommended Corrective Actions for OCIO and IMSC review			

Activity	Project Sponsor	OCIO	IMSC	ECIM
Evaluate Phase				
5.0 Conduct Post-Implementation Review	5.2 Conduct review as scheduled or necessary, based on documented criteria; Re-score if necessary and include recommended corrective actions			
6.0 Lessons Learned	6.2 Identify lessons learned and recommend process improvements	6.1 Evaluate Corporate IT Capital Planning and Investment process 6.2 Identify lessons learned and recommend process improvements	6.2 Identify lessons learned and recommend process improvements	6.3 Endorse recommended process changes

Appendix C. Linkages to DOE Strategic Planning and Budget Process

Time Period	Process/Event	Products/Deliverables
October - December (current fiscal year)	<ul style="list-style-type: none"> • CFO, Assistant Secretaries, Lab Directors discuss current year allocations and previous year leftover funds • OMB issues passback for President's Budget 	<ul style="list-style-type: none"> • CFO issues current FY funding allocations once Congress appropriates funds • CFO issues internal call for the President's budget and congressional justification and for Exhibit 53 • CFO electronically provides Exhibit 53 to OMB
January - February	<ul style="list-style-type: none"> • CFO issues Budget instructions to the field for completing their IT-WBS and A-11 53 • ECIM/IMSC meet to determine initiative viability, assign Program sponsors to potential investments, and monitor ongoing investments • PSs prepare IT initiatives for inclusion in the investment pool and consideration for the Outyear budget <ul style="list-style-type: none"> – Conduct self-assessments for viable IT initiatives – Complete required documentation 	<ul style="list-style-type: none"> • PSs submit IT initiatives into IT investment pool • CFO prepares and inputs schedules into OMB's system • DOE submits FY + 1 President's budget to Congress and reports on performance of Operating Budget
March - May	<ul style="list-style-type: none"> • ECIM/IMSC meet to select new or continue existing investments for inclusion in the Corporate IT portfolio of investments. • Congressional hearings take place on FY + 1 President's Budget • Compile Annual Agency Performance Report for submission to Congress. 	<ul style="list-style-type: none"> • Completed IT investment documentation submitted for IMSC/ECIM review • Corporate IT portfolio of investments to be funded for FY + 2 budget • PSs finalize performance goals and measures for selected investments and submit to ECIM/IMSC • Agency Performance Report
May - June	<ul style="list-style-type: none"> • IT investment control begins for funded but non-operational IT projects • IT investment evaluation phase begins for operational IT projects • Guidance issued for FY + 2 budget preparation 	<ul style="list-style-type: none"> • ECIM/IMSC meets and reviews ongoing IT projects as required • CFO issues a call for <ul style="list-style-type: none"> – FY + 2 budget formulation – Strategic Plan updates
July - August	<ul style="list-style-type: none"> • Corporate review of the budget begins • Secretary makes final decisions regarding FY +2 budget 	<ul style="list-style-type: none"> • Corporate IT Portfolio • CFO submits DOE FY + 2 budget request to OMB along with IT 53
August - September	<ul style="list-style-type: none"> • OMB review of the DOE budget • Submission of FY + 1 President's Budget begins • Complete DOE Annual Performance Plan 	<ul style="list-style-type: none"> • DOE Strategic Plan submitted to OMB (every 5 years) • President's Budget along with DOE Annual Performance Plan • CIO issues Annual Operation/Action Plan • CIO may issue updated IT Strategic Plan

Appendix D. Strategic Information Management Process

Overview

The DOE SIM process is a cooperative process used by a broad spectrum of DOE organizations to review and improve business functions. The process is one of a sequence of unique, complex, and connected activities in a *project's lifecycle* that enables a DOE entity to achieve overall project objectives. A Cross-Functional Team of approximately 25 to 30 subject matter experts, both Federal and contractor staff, are typically involved in a SIM project. Consensus is reached within the Team on the best information technology solution for a business need, and a business case is prepared to obtain management support and financing for the recommended solution.

A SIM project takes 6 months to a year to complete (project initiation through delivery of the business case). The SIM participants typically attend three 3-day workshops, in addition to devoting approximately 25 percent of their time to the project. Between workshops, they work independently or in focus groups to complete assignments related to the development of the business case. This investment of time is a positive statement about the Team's commitment to the project and determination to produce a viable and valuable product for Departmental decision-makers.

Most of the early effort goes into planning. A core planning team develops agendas for completing activities that help the Team collect information needed to develop a business case. A Base Case is also developed during this time that normally serves as one of the alternatives considered by the SIM Team as a viable alternative. The Base Case later serves as a reference point for comparing other alternatives considered.

Workshops, data collection, and analysis occur over a 4 - 6 month. While the business case is assembled over the course of the project and presented as a draft at the last workshop, an additional 2 - 3 months are needed to finalize the business case and prepare the briefing to present it to senior management. The process allows adequate time for final updates and a full review of the final business case by the SIM participants before further distribution.

Project closure is non time-consuming to the participants. The effort is performed by the Project Sponsors and the DOE SIM Program Manager to distribute thank you memos and solicit feedback from participants on the effectiveness of the SIM process. Surveys are often used to collect this information.

SIM Project Business Case

The business case is a tool that supports planning and decision-making. It performs the following functions.

- Defines required functionality and shows where the current system/processes are not meeting those needs.
- States the financial, technical, cultural, and political consequences of the alternatives considered.

- Recommends the alternative considered by the participants to be the best solution.
- Recommends specific process improvements for related business functions.
- Shows expected cash flow over the project lifecycle for all considered alternatives.
- Provides the rationale for quantifying benefits and costs.
- Describes the overall impact in terms of discounted cash flow, payback period, and return on investment.
- Justifies capital investments for major information systems and infrastructure components.

The business case identifies the most desirable investment solution for a business need, based on the consensus opinion of a Departmentwide team of subject area experts. It is a tool that supports decision-making during the current planning stage and into future stages of the project (requirements, design/solicitation, implementation, testing, operations, and maintenance). The financial analysis usually covers a 5 or 6 year timeframe. It is used to justify the initial capital investments planned for a major information system, as well as establish future budgets for other infrastructure expenditures and acquisitions that are anticipated over that timeframe.

The business case provided through the SIM process should not be construed as a budget document, a management accounting report, a financial reporting statement, or a technical design/specifications document. It generally provides assumptions, arbitrary judgments, and new data that go beyond existing budgets and business plans.

There is rarely just one way to achieve the goals needed to meet business needs. The alternatives developed for a business case represent some of the most viable options known for achieving the Department's business goals. In addition, many variations of the selected options may be possible. As technologies improve and evolve, and Departmental resources change, more effective options may emerge as being more practical and appropriate for the DOE environment. Significant changes would require revisions to the business case by the business function owner.

Summarized results of the analyses listed below are typically provided in a business case to support the recommendation. It is important to note, however, that each business case is tailored to the specific objectives of the SIM project. It may not require all listed, or it may require more extensive studies in other areas.

- **Baseline**

The current environment (baseline) is a time-sensitive snapshot of the existing technology and infrastructure used to support the selected business area. The baseline is produced to set a point of reference for comparing current and future needs and for measuring on-going progress and Program accomplishments. The baseline data are used to develop and measure future performance levels (e.g., cost savings, successes, benefits, service levels, and limitations).

- **Best Practices**

Research is often performed in order to determine current industry and government best practices. Other public and private organizations with similar business needs may be also contacted to determine the advantages, disadvantages, and lessons learned with relevant technology acquisitions and use. Data gathered through the activity are used in formulating the business case alternatives and recommendations.

- **Needs Assessment**

The assessment of the future state envisioned for the business function usually covers the next 3-5 years. The information is used to determine the current and future needs and requirements for the business area or activity. The assessment requires input from the business area service and product providers and customers. Research and analyses are performed to predict the expected evolution of the technology and the infrastructure needed to support the business area.

- **Alternatives**

An analysis of the baseline and needs assessment data is conducted to determine the technological and organizational changes that the Department must implement in order to satisfy current and future business area needs. The gap between the requirements and the currently available services and resources is determined and alternative solutions are developed for satisfying the business area needs. Two or three alternatives determined viable by the SIM Team are then proposed and explored, including the financial, technical, cultural, and political consequences of each alternative considered.

- **Process Improvements**

A change in mission or business function direction, or the implementation of a new or enhanced system often requires changes in the way business is accomplished on a day-to-day basis. Process improvements to address the changing environment are included as part of the alternatives being proposed, or they are presented as standalone recommendations, if they are not linked to a specific alternative.

- **Analysis of Benefits and Costs**

An analysis of benefits and costs is the systematic method used to compare alternative solutions. The projected benefits and costs are determined for each alternative. Analyses of the benefits and costs are conducted to predict each alternative's investment payback point and return on investment data, and to determine the best financial solution. The results of an analysis of benefits and costs validate whether or not it is cost effective to proceed with one of the proposed business solutions.

Summary

The SIM process assists owners of Departmental business functions in developing Corporate approaches for satisfying their business needs. It enables DOE to build on the expertise and technology advances that exist in organizations throughout the Department. The effective sharing of information and resources enables all Departmental elements to achieve a higher level of productivity and mitigates the effects of shrinking budgets and a reduced work force.

The SIM process is an integral part of a project lifecycle. It is used to develop the business case for a major project being proposed or planned by an organization, and much of the information collected and summarized in the supporting business case work products are used in future phases of the project.

Appendix E. Scoring Methodology for Corporate IT Initiatives

SCORING AN INITIATIVE

At the beginning of every fiscal year, the Department establishes the framework for scoring IT initiatives. The scoring framework consists of four primary elements.

- Definition of scoring categories including business case, benefit-cost, and risk.
- Identification of scoring criteria under each category that help to determine how well an initiative is expected to perform.
- Determination of scoring weights to help determine an investment's rank among all IT investments.
- Application of standard scoring rules for each criterion – how the weights are assigned to each scoring category and individual scoring criteria.

Initiative scoring process is expected to be continuously refined as the Department gains practical experience formulation and execution of approach. Refinements are likely to include the addition, deletion, or modification of scoring criteria and the recalibration of their scoring rules.

The following illustrations provide detailed descriptions of the scoring methodology.

CRITERIA		Scoring Rules			
		-1	0	1	2
Business Case	3				
Mandatory Requirement	3		Initiative is not mandatory	Initiative inferred by or strongly suggested in law, regulation	Initiative specifically required by law, regulation
Alignment to Mission, Goals, and Objectives	3	The initiative does not map to any mission, goal, or objective -OR- The initiative supports the Department's (or sub-organization) mission, goals, and objectives but no documentation exists that clearly demonstrates the strategic alignment	Explicit documentation clearly maps the initiative to missions, goals, and objectives identified in the DOE Strategic Plan, the DOE IM Strategic Plan, and sub-organization documents (if applicable)	Explicit documentation clearly maps the initiative to missions, goals, and objectives identified in the DOE Strategic Plan, the DOE IM Strategic Plan, and sub-organization documents (if applicable) -AND- Accomplishment of Departmental (or sub-organization) mission, goals, and objectives is highly dependent on the initiative	
Process Improvement	3	The initiative does/will <u>not</u> assist or generate process improvements	The initiative does/will assist or generate process improvements within a functional area only	The initiative does/will assist or generate a process improvement within a Program or Field Office only	The initiative does/will assist or generate a process improvement within the entire Department
Consequences of Not Doing the Initiative	2	Business can continue and goals met without doing anything -OR- For on-going initiatives: If the initiative were discontinued, no adverse impacts would occur	Business processes can continue but may not be able to meet performance goals -AND- No viable alternatives exist that can achieve the same results for less risk or cost	Current business operations cannot continue unless this initiative is undertaken -AND- No viable alternatives exist that can achieve the same results for less risk or cost	Current business operations cannot continue unless this initiative is undertaken -AND- No viable alternatives exist that can achieve the same results for less risk or cost -AND- Delaying the initiative will result in significantly higher costs in the future
Impact on Internal and/or External Customers	2	The initiative has/will not significantly improve services to internal and/or external customers	The initiative has/will significantly improve services to internal and/or external customers and is clearly documented	The initiative has/will significantly improve services to internal and/or external customers and is clearly documented -AND- Failure to fulfill the customer's requirements will result in multiple adverse impacts for the customer	
Scope of Beneficiaries	1		The initiative does/will support a single DOE function and/or organization	The initiative does/will support multiple DOE functions and/or organizations	The initiative does/will support multiple government agencies or Departments
Cross-Functional/Organizational Impact	1	The functions to be supported are not clearly stated -OR- The areas affected by the investment cannot support it.	The investment supports a single DOE function -AND- The user community is clearly defined in size and scope.	The investment supports multiple DOE functions -AND- The user community is clearly defined in size and scope	

CRITERIA	Wt	Scoring Rules			
		-1	0	1	2
Cost/Benefit	1				
ROI (Return/Investment Ratio) ¹	3	ROI < 2	ROI ≥ 2	ROI > 4	ROI > 6
ROI (Recovery Schedule)	2	The ROI (Return/Investment Ratio) occurs more than 4 years after fielding initial module or functional increment	The ROI (Return/Investment Ratio) occurs within 4 years of fielding initial module or functional increment	The ROI (Return/Investment Ratio) occurs within 3 years of fielding initial module or functional increment	The ROI (Return/Investment Ratio) occurs within 2 years of fielding initial module or functional increment
ROI (Intangible)	2		Some intangible returns exist, but they are not significant	Intangible returns have significant impact on mission performance	
Payback Period	1	Investment will not be recovered within the economic life span of the project	Investment will be recovered within the economic life span of the project	Investment will be recovered within the first half of the economic life span of the project	Investment will be recovered within the first quarter of the economic life span of the project

¹ ROI (return on investment)

		Scoring Rules			
CRITERIA	Wt	-1	0	1	2
Risk	2				
History of Success	3	Developer has failed to deliver a major initiative in past 3 years -OR- Development responsibilities are unclear	Developer has not failed to deliver a major initiative in the past 3 years -AND- Development responsibilities are clear	Developer has no history of failures, delays, or quality problems in past 3 years -AND- Development responsibilities are clear and documented	
Alignment with Information Architecture (IA) and Standards	3	The initiative's compatibility with Information Architecture principles, practices, and procedures has not been addressed -OR- Y2K issues have not been addressed or resolved	The initiative is consistent with IA principles, practices, and procedures -AND- The initiative is consistent with information, applications, data, and technology baselines -AND- Y2K issues have been addressed and resolved	The initiative is consistent with IA principles, practices, and procedures -AND- The initiative is consistent with information, applications, data, and technology baselines -AND- The initiative uses standard software and hardware -AND- Y2K issues have been addressed and resolved	The initiative is consistent with IA principles, practices, and procedures -AND- The initiative is consistent with information, applications, data, and technology baselines -AND- The initiative uses standard software and hardware -AND- Configuration management and change control procedures have been addressed and are documented -AND- The initiative incorporates the following attributes to the greatest degree possible: scalability, portability, adaptability, accessibility, and vertical utility -AND- Y2K issues have been addressed and resolved
Initiative Ownership and Endorsement	3	Roles and responsibilities for initiative design, development, and deployment have not been documented -OR- Initiative ownership is unclear -OR- User Community input has not been collected or documented	Roles and responsibilities for initiative design, development, and deployment have been documented -AND- The overall initiative "owner" is the Functional Lead -AND- User Community endorsement is expected but not yet documented	Roles and responsibilities for initiative design, development, and deployment have been documented -AND- The overall initiative "owner" is the Functional Lead -AND- The User Community has been surveyed and endorses the initiative	
Security	2	Access controls are not adequate or there are no redundant edits or audit trails to protect against corruption or transactions. If important decisions are being made from the data, procedures for validating the data may not be fully adequate. The initiative is sensitive and accessible via the Internet and to vendors or customers outside DOE	Adequate security measures have been/will be designed into the initiative to restrict access to sensitive data. Important decisions are made from this initiative but there are adequate procedures to validate results. The initiative is sensitive but is accessible only to internal DOE customers -OR- The initiative is not sensitive, important decisions will not be made based on its information, it is not accessible via the Internet to customers outside DOE, and adequate security measures are in place	Adequate security measures are in place or being developed to restrict access to sensitive information or functions; there are redundant edits and/or audit trail mechanisms to protect against corruption of transactions prior to receipt; results are validated before the decisions are made -OR- The initiative is not sensitive, important decisions will not be made based on its information, it is not accessible via the Internet to customers outside DOE, and adequate security measures are in place	

Scoring Rules					
CRITERIA	Wt	-1	0	1	2
Schedule Risk	2	Factors on the initiative's critical path may impact this year's schedule by 30% or more -OR- The initiative's impact depends significantly on another initiative still needing completion	Factors on the initiative's critical path may impact this year's schedule by no more than 10% -OR- The initiative's impact depends on another initiative still needing completion -AND- Risk mitigation actions have been identified	For the next year, there are no predicted or foreseen adverse impacts on the initiative's schedule -AND- The initiative's impact does not depend significantly on any other initiative still needing completion	For the next year, there are no predicted or foreseen adverse impacts on the initiative's schedule -AND- There are no major interfaces with other initiatives or systems
Cost Sensitivity	2	The cost estimate is highly dependent upon uncontrolled variables (e.g., availability of external funding sources, changes in component pricing or maintenance contracts) and is therefore subject to significant change (>10%)	Situations may arise that may cause this year's costs to vary by no more than 10% of estimates	Measures to identify in a timely manner and reduce variances between the actual cost of work performed and the budgeted cost of work performed are clearly documented	Measures to identify in a timely manner and reduce variances between the actual cost of work performed and the budgeted cost of work performed are clearly documented -AND- Cost estimates are not significantly dependent upon identifiable uncontrolled variables
Performance Measures	1	Specific performance measures for supported functions are unknown or not formally documented -OR- Performance targets for the initiative are not documented	Specific performance measures for <u>some</u> supported functions are formally documented -AND- Specific performance targets for the initiative are defined in terms of supported functions measures	Specific performance measures for <u>all</u> supported functions are formally documented -AND- Specific performance targets for the initiative are defined in terms of supported functions measures	
Incremental/Modular Approach	1	Applicability of a phased, modular design, development, and deployment approach has not been determined	Applicability of a phased, modular design, development, and deployment approach has been determined and are reflected in planning and operations documents	Initiatives are designed, developed, and deployed using as narrow a scope and are as brief in duration as possible to increase the probability of success	Initiatives contain functional increments or modular system components that could remain in use if the initiative were canceled

Scoring Rules					
CRITERIA	Wt	-1	0	1	2
Flexible Acquisition Approach	1	Acquisition strategy is unknown or unpublished -OR- Acquisition strategy is known, but will not deliver 1 or more increments or modules in < 180 days -OR- Acquisition strategy makes no use of GWACs to acquire COTS/NDI hardware and software or IT services	Acquisition strategy supports the development approach -AND- Acquisition strategy makes some use of GWACs to acquire COTS/NDI hardware and software or IT services	Acquisition strategy supports the development approach -AND- Acquisition strategy describes how modules or functional increments will each be fielded in < 180 days -AND- The acquisition strategy makes maximum use of GWACs to acquire COTS/NDI hardware and software or IT services	
Use of Commercial-Off- the-Shelf (COTS) and Non-Developmental Items (NDI) Software	1	The design is incomplete or not published -OR- There is evidence that use of COTS/NDI has not been fully explored	Custom-developed application-level software is > 30% of total application-level software	Custom-developed application-level software is < 30% of total application-level software	

Appendix F. Identify and Prioritize Deficiencies

The suggested method for identifying and prioritizing initiative deficiencies is presented in table 15.

Table 15. Approach to Prioritize IT Initiative Deficiencies

	Deficiency	Impact	Probability	Cost	Expected Value (Probability * Cost)
ID#1	Technical	Cost, Architecture	High (1.0)		
ID#2	Cost	Cost, Schedule	High (1.0)		
ID#3	Management	Schedule	Medium (0.5)		
ID#4			Low (0.25)		

Deficiency – Describes any aspect of the initiative that has gone wrong or will potentially go wrong. Deficiency includes existing problems and potential problems within the life of the initiative. Examples of deficiencies include changes in management, initiative scope, technical approach, and cost.

Impact – Describes severity of consequences, if the deficiency is not addressed and can be either quantitative or qualitative. Consequences can affect the initiative technically by impacting baseline values, such as cost, schedule, and architecture or may affect the initiative’s mission contribution by; for example, by altering the operational performance or expected level of returns.

Probability – Describes the degree of likelihood that the deficiency will occur.

High Deficiency will occur. High score equals a numeric rating of 1.0.

Medium Deficiency will very likely occur unless corrective action is taken. Medium score equals a numeric rating of 0.5.

Low Deficiency is not very likely to occur; corrective action may/may not need to be taken. Low score equals a numeric rating of 0.25.

A simplistic approach to get a prioritized list of deficiencies to be addressed would be to perform the following calculation and rank the results by the expected value.

$$\text{Expected Deficiency Value} = \text{Deficiency Probability} \times \text{Consequences}$$

Appendix G. Glossary of Terms for Corporate IT Capital Planning and Investment

Acquisition Plan	Description of the acquisition approach including the contract strategy (define government and contractor roles and responsibilities), use of COTS/NDI, and major milestones (such as software releases, hardware delivery and installation, and testing).
Alternatives Analysis	Assessment of all technological options to determine the optimal solution for meeting functional requirements based on cost, scope and schedule; considers in-house or outsourcing options.
Annual IT Initiative Cost/Annual Organization Budget	Percentage of the organization's annual budget that is allocated for a specific IT initiative (I-TIPS choices include over 20%, up to 10%, up to 20%, and up to 5%).
Architectural Alignment	Degree to which the IT initiative is compliant with DOE's information technology architecture.
Award Fee	May be used in contracts when the Government wishes to motivate a contractor and other incentives cannot be used because contractor performance cannot be measured objectively.
Basic Ordering Agreement	Written instrument of understanding, negotiated between an agency, contracting activity, or contracting office and a contractor, that contains: <ul style="list-style-type: none"> • Terms and clauses applying to future contracts (orders) between the parties during its term; • A description, as specific as practicable, of supplies or services to be provided; • Methods for pricing, issuing, and delivering future orders under the basic ordering agreement. Basic ordering agreement is not a contract.
Blanket Purchase Agreement (BPA)	Simplified method of filling anticipated repetitive needs for supplies or services by establishing "charge accounts" with qualified sources of supply. Use of BPAs does not exempt an agency from the responsibility for keeping obligations and expenditures within available funds.
Budget Situation	Identify the organization's stage in the budgeting process with regards to the initiative (I-TIPS choices include funds have been budgeted, funds to be reallocated, funds to be reprogrammed, and new funds are required).
Budget Situation Comments	Further amplification about the status of the organization's IT budget and the projected status (for example, funds are expected to be allocated within 30 days or a new funding source must be identified).
Business Case	Structured proposal for business improvement that functions as a decision package for organizational decision-makers. A business case includes an analysis of business process performance and associated needs or problems, proposed alternative solutions, assumptions, constraints, and a risk-adjusted cost-benefit analysis.
Contract Comments	Description of any contract issues or any additional contract information (e.g., a contract expected to be awards by a certain date).
Contract Name	Title of the contract associated with the IT initiative.
Contract Number	Number of the contract associated with the IT initiative.
Contract Organization	Name of the organization that sponsors the contract associated with the IT initiative.

Contract Type	Designation of approach to contract such as: <ul style="list-style-type: none"> • Award Fee • Basic Ordering Agreement • Blanket Purchase Agreement • Cost-Plus-Award-Fee • Cost-Plus-Fixed-Fee • Cost-Plus-Incentive-Fee • Cost Reimbursement • Federal Supply Schedule • Firm-Fixed-Price • Incentive Contract • Indefinite Delivery/Indefinite Quantity (IDIQ) • Time & Materials (T&M)
Control	Ongoing monitoring process that manages investments against schedules, budgets, and performance measures.
Corporate Management Information Program (CMIP)	DOE Headquarters managed-development program for funding new, enhanced, or replacement Corporate systems. Projects are reviewed quarterly by the OCIO and semiannually by the CMIP Review Board (CIO, CFO, and MA-1).
Cost/Expense Avoidance	Life-cycle benefit type that results in IT savings by better usage of resources (e.g., a more productive staff postpones the need for additional recruitment and office space).
Cost/Expense Reduction: Productivity and Headcount	Life-cycle benefit type that estimates potential productivity improvements and headcount savings as a result of a system being implemented.
Cost-Plus-Award-Fee	Cost-reimbursement contract that provides for a fee consisting of: <ul style="list-style-type: none"> • A base amount fixed at inception of the contract; • An award amount that the contractor may earn in whole or in part during performance and that is sufficient to provide motivation for excellence in such areas as quality, timeliness, technical ingenuity, and cost-effective management.
Cost-Plus-Fixed-Fee	Cost-reimbursement contract that provides for payment to the contractor of a negotiated fee that is fixed at the inception of a contract. The fixed fee does not vary with actual cost, but may be adjusted as a result of changes in the work to be performed under the contract. This contract type permits contracting for efforts that might otherwise present too great a risk to contractors, but it provides the contractor only a minimum incentive to control costs.
Cost-Plus-Incentive-Fee	Cost-reimbursement contract that provides for the initially negotiated fee to be adjusted later by a formula based on the relationship of total allowable costs to total target costs.
Cost Reimbursement	Contract that provides for payment of allowable incurred costs prescribed in the contract. These contracts establish an estimate of total cost for the purpose of obligating funds and establishing a ceiling that the contractor may not exceed (except at its own risk) without the approval of the contracting officer.
Data Documentation	Compilation of materials including data dictionary, decomposition diagrams, and data models.
Description of Initiative	Brief overview of initiative of no more than 100 words to include: <ul style="list-style-type: none"> • Short summary of proposed initiative; • Statement on the business functions processes the initiative supports; • Brief summary of benefits resulting from the initiative (tangible or intangible).
Design Documentation	Document that includes system design diagrams.

Development/Modernization/Enhancement	Includes Program costs for new systems, changes or modifications to existing or legacy systems that improve capability or performance, changes mandated by Congress or agency leadership, personnel costs for project management and direct support.
Direct Beneficiaries	Organizations or groups that receive direct benefit from the initiative.
Documentation Set	Documents that may be required to fully justify and implement an IT investment. These include: Business Case, Functional Requirements, Feasibility Study, Risk Assessment and Management Plan, Initiative Pilot/Prototype Plans, Year 2000 Plan, Security Plan, ROI/Cost Benefit Analysis, Alternatives Analysis, Funding Source Name, Technical Requirements, Design Documentation, Relationship to Existing Systems, Data Documentation, Software Code Manual, Project Plan, Acquisition Plan, Independent Verification and Validation (IV&V), and Test Plan(s). A more detailed description of each document is available in this glossary.
Evaluate	Review process that takes place after an investment is operational to determine whether the investment meet expectations.
Expected Outcome	Projected end result of the initiative (e.g., system(s) being replaced or improved customer service) that is directly linked with performance measures.
External Funding	Percentage of funding for the initiative that comes from a source outside of the sponsoring organization (I-TIPS choices include 0%, up to 100%, up to 25%, up to 50%, and up to 75%).
Feasibility Study	Preliminary research performed to determine the viability of the proposed initiative by performing an alternatives analysis including conducting market research and extensive interviews with subject matter experts. Also includes a proposed technical approach and preliminary cost, scope, and schedule data.
Federal Supply Schedule	Under the schedules program, GSA enters into contracts with commercial firms to provide supplies and services at stated prices for given periods of time. Orders are placed directly with the schedule contractor, and deliveries are made directly to the customer.
Firm-Fixed-Price	A price that is not subject to any adjustment on the basis of the contractor's cost experience in performing the contract. This contract type places upon the contractor maximum risk and full responsibility for all costs and resulting profit or loss. It provides maximum incentive for the contractor to control costs and perform effectively and imposes a minimum administrative burden upon the contracting parties.
Functional Manager (FM)	Individual that initiates the project.
Functional Requirements	A description of system capabilities or functions that are required to execute a required process such as a communication link between several locations and generating specific reports.
Funding Source Name	Identifies the source of funds for the initiative (e.g., Appropriation 'X', Working Capital Fund, or CCC).
Funding Source Type	Description of the initiative's funding source (e.g., Appropriation, Internal, Headquarters Collaborate Group, Memorandum of Understanding, Working Capital Fund, or Interagency Agreement).
Hardware/Equipment	Includes any equipment used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, inter-change, transmission, or reception of data or information (e.g., computers and modems); capital and non-capital purchases or leases.

Incentive Contract	Type of contract used when a firm-fixed price contract is not appropriate and the required supplies or services can be acquired at lower costs (and in certain instances, with improved delivery or technical performance) by relating the amount of profit or fee payable under the contract to the contractor's performance.
Indefinite Delivery/Indefinite Quantity (IDIQ)	An IDIQ contract, within stated limits, of supplies or services to be furnished during a fixed period, with deliveries or performance to be scheduled by placing orders with the contractor.
Independent Verification and Validation (IV&V) Documentation	Evaluation or assessment of a system, initiative, or project performed by an independent contractor.
Initiative Outlook — Mission Life	Length of time the mission is expected to be effective (I-TIPS choices include up to 2 years, 4 years, 6 years or longer than 6 years).
Initiative Outlook — Technology Life	Period of time before improved technology would make an asset obsolete (I-TIPS choices include up to 2 years, 4 years, 6 years or longer than 6 years).
Initiative Outlook — Project Life	Project (supported by IT) duration from initial concept to fielding (I-TIPS choices include up to 2 years, 4 years, 6 years or longer than 6 years).
Initiative Pilot/Prototype Plans	Overview of plans for piloting the initiative concept prior to full scale development including technical and Programmatic details of the pilot such as cost, scope, schedule, hardware, software, communications, and architectural considerations.
Initiative Phase	Initiative falls into one of the following categories: <ul style="list-style-type: none"> • Initial concept: Prior to developing an initiative proposal; • New: Preparing feasibility study, requirements, and formal proposal; • In-development/Implementation: Initiative is currently being developed; • Revision/Modification/Modernization: Alteration to an initiative that is already operational; • Operational: Initiative has been deployed and is in use; • Retirement/archive: Initiative is being retired or replaced.
Initiative Type	Initiative falls into one of the categories listed in Selection A and possibly one or more of those categories in Selection B. Selection A: <ul style="list-style-type: none"> • Administrative • Infrastructure • Program Selection B: <ul style="list-style-type: none"> • Cross-Agency • Cross-Functional • Enterprise • Financial • Mandated • Mission Critical • Research and Development.
Investment Pool	Collection of proposed IT initiatives that are considered for selection into the portfolio.

Life Cycle Benefits	<p>Benefits include:</p> <ul style="list-style-type: none"> • Cost/Expense Reduction: productivity and headcount; • Other Expense Reductions: Operational; • Cost/Expense Avoidance; • Revenue-Related Savings. <p>These terms are more clearly defined in the glossary.</p>
Life Cycle Costs	<p>Total cost of an IT initiative over its expected life. Costs should be identified in two broad categories (refer to the glossary for a more detailed description of each category):</p> <ul style="list-style-type: none"> • Steady State; • Development/Modernization/Enhancement. <p>Within each broad category, costs should be allocated to six secondary categories that include:</p> <ul style="list-style-type: none"> • Equipment; • Personnel; • Software; • Services; • Supplies; • Support Services.
Mission Support	Identifies the goals within each agency and mission area that the initiative supports.
Opportunity Costs	Cost of not investing in the initiative or cost of a forgone option (I-TIPS choices include low, moderate, or high).
Other Cost/Expense Reductions: Operational and Financial	Life-cycle benefit type that includes but is not limited to savings in the costs of materials, documents, communications, printing and copying, inventory and storage, transport and distribution, rates and rents, space and buildings and in the use of plant and equipment, cash or lending limits.
Performance Measures	Method used to determine the success of an initiative by assessing the investment contribution to predetermined strategic goals. Measures are quantitative (staff-hours saved, dollars saved, reduction in errors) or qualitative (quality of life, customer satisfaction).
Personnel	Includes the salary and benefits for government personnel who perform IT functions 51% or more of their time. Functions include but are not limited to policy, management, systems development, operations, telecommunications, computer security, contracting, and secretarial support. Personnel in user organizations who simply use information technology assets incidental to the performance of their primary functions are not to be included.
Planned Completion Date	Date that the IT initiative is expected to be fully operational.
Planned Start Date	Date that system development for the IT initiative begins.
Post-Implementation Review (PIR)	Evaluation of the IT project after it has been fully implemented to determine whether the targeted outcome (e.g., performance measures) of the project has been achieved. The PIR should also include an evaluation of the effectiveness of the Select—Control—Evaluate process as it relates to the IT initiative.
Project Sponsor (PS)	Individual who has authority and ownership of the project (most PSs are the FM who initiates the project).
Project Director (PD)	Individual who manages the day-to-day project operations.

Project Plan	Outlines performance-based management approach (current and estimated goals) including project milestones and associated resources, tools and techniques, and organizational roles and responsibilities.
Relationship to Existing Systems	Description of interfaces and interoperability with other current or planned systems.
Replaced System Savings	Operations and maintenance (O&M) costs avoided when an existing system is replaced, calculated from the old system's phase-out through the remainder of the investment of the system's life.
Revenue-Related Savings	Life-cycle benefit that relates to the marketing position of the enterprise and its income. For example, systems that improve the level of service to clients or support new products and services may lead to an increase in revenue. Applications that reduce the exposure of business risk or to adverse competitive and environmental influences are given a high priority.
Risk Analysis	Brief textual summary of the Risk Assessment and Management Plan.
Risk Assessment and Management Plan	A description of potential cost, schedule, and performance risks, and impact of the proposed system to the infrastructure; includes a sensitivity analysis to articulate the effect different outcomes might have on diminishing or exacerbating risk. Provides an approach to managing all potential risks.
ROI/Cost Benefit Analysis	Compares the costs associated with the IT initiative to the savings derived from the expected business outcome and operational improvements resulting from the IT initiative; $ROI = \text{tangible benefit} + \text{replaced systems savings} - \text{investment cost}$.
ROI Recovery Schedule	Projected date in which the ROI will occur.
Security Plan	Description of system security considerations, such as system access, physical or architectural modifications, and adherence to Federal and DOE security standards.
Select	Process used to identify all new, ongoing, and operational investments for inclusion into the funded IT portfolio.
Self-Assessment	Process of critically evaluating an initiative by scoring it against criteria established at the Headquarters level. Usually performed by the Project Sponsor with the assistance of the project director and the technical contact in the case of major investments, a self-assessment is performed by an IPT, chaired by the Project Sponsor.
Sensitivity Analysis	Analysis of how sensitive outcomes are to changes in assumptions regarding the initiative. The assumptions that deserve the most attention depend largely on the dominant benefit and cost elements and the areas of greatest uncertainty of the Program or process being analyzed.
Services	Any service, other than support services, performed or furnished by using hardware or software (these terms are more clearly defined in the glossary). Includes teleprocessing, local batch processing, electronic mail, voice mail, centrex, cellular telephone, facsimile, and packet switching.
Software	Any software, including firmware, specifically designed to make use of and extend the capabilities of Federal Information Processing (FIP) equipment (please refer to the hardware definition in the glossary).

Software Code Manual	Compilation of software code associated with the initiative.
Steady State	Cost of operations at a current capability and performance level to include costs such as personnel, maintenance of existing AISs (legacy systems), corrective software maintenance, and replacement of broken IT equipment.
Strategic Goals and Sub-goals	DOE has a number of strategic goals as defined in their strategic plan. The Department's Program Areas also have subgoals, which track directly with the primary goals as well as with their specific mission.
Supplies	Any consumable item designed specifically for use with equipment, software, services, or support services. These terms are more clearly defined in the glossary.
Support Services	Any commercial services, including maintenance, used in support of hardware/equipment, software or services (these terms are more clearly defined in the glossary). Support services include source data entry, training, planning or the use and acquisition of information technology, studies such as alternative analysis, facilities management or government-furnished IT, custom software development, system analysis and design, and computer performance evaluation and capacity management.
Tangible Benefit	Estimated tangible, cost-based savings for the system life, includes effects of transition such as phase-in and post-training learning curve leading to lower cost savings in initial years.
Task/Delivery Order No.	Number of contract task or delivery order associated with the initiative.
Technical Contact (TC)	Individual responsible for technical aspects of the initiative or the project.
Technical Requirements	Description of hardware, software, or communications requirements associated with the initiative.
Test Plan(s)	Description of all planned test events for the initiative including specifics on test equipment, facilities, contractor participation, infrastructure requirements, and test objectives or measures of effectiveness.
Time & Materials (T&M)	Acquiring supplies or services on the basis of the following: <ul style="list-style-type: none"> • Direct labor hours at specified fixed hourly rates that include wages, overhead, general and administrative expenses, and profit; and • Materials at cost, including, if appropriate, material handling costs as part of material costs.
Use of COTS/NDI	Percentage of total investment that uses COTS product(s) or Non-Developmental Items (I-TIPS choices include 0%, up to 100%, up to 25%, up to 50%, and up to 75%).
Year 2000 Plan	Description of how initiative meet Year 2000 requirements.

Appendix H. References

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